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TRANSONIC FAN/COMPRESSOR ROTOR DESIGN STUDY

Volume IV

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General Electric Company
Aircraft Engine Business Group
Advanced Technology Programs Dept.
Cincinnati, Ohio 45215

February 1982

Final Report for Period September 1980 - February 1982

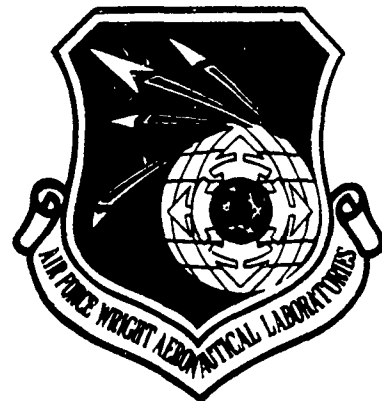
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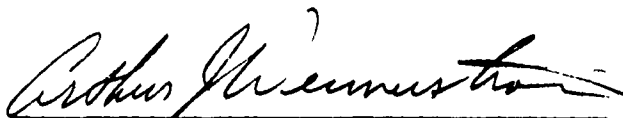


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This technical report has been reviewed and is approved for publication.



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| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Volumes I through VI of this report describes the aerodynamic design of a series of five transonic rotors all parametrically related to a base- line design documented in Technical Report AFAPL-TR-79-2078. Each of the five designs deviate from the base line, in so far as practical, by a variation of one parameter only. The parametric variations are specified at the rotor tip. The original hub characteristics were preserved to the maximum extent practical. The varied parameter was adjusted along the span. | | |

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→ This volume describes the aerodynamic design details of the Phase III rotor. The Phase III rotor was designed to have a steeper average suction surface angle in the supersonic region ahead of the shock than the baseline rotor. This results in a smaller cascade throat area in the outer 80% of the blade than the baseline rotor. The hub region was kept essentially the same as the baseline rotor. The location of maximum airfoil thickness is 70% of length at the tip and 56% at the hub which is the same as the baseline rotor.

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VOLUME IV

PHASE III ROTOR DESIGN

Foreword

This Final Technical Report was prepared by the Advanced Technology Programs Department, Aircraft Engine Business Group, General Electric Company, Evendale, Ohio for the United States Air Force Systems Command, Air Force Wright Aeronautical Laboratories Wright-Patterson Air Force Base, Ohio under Contract F33615-80-C-2059. The work was performed over a period of one year starting in September 1980. Effren Strain (Captain USAF) was the Air Force Project Engineer for this program.

This report describes the results of an effort to aerodynamically define five rotor designs, all parametrically related to a base line design which could be evaluated by future testing in order to define the sensitivity of transonic blade rows to several design variables.

For the General Electric Company Mr. D.E. Parker was the Technical Program Manager for this program. Mr. M.R. Simonson was the principal investigator. Mr. A.J. Bilhardt was the overall Program Manager.



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LIST OF SYMBOLS AND ABBREVIATIONS

1. Used in Circumferential Average Flow Output Tables

| | | |
|-----------------|---|--------------------------------------|
| STA | calculation station number | |
| WTF | total airflow | |
| PSIC | stream function (0 = tip (OD), 1 = hub (ID)) | |
| Z | axial location | inches |
| R | radius | inches |
| PHI | streamline slope | degrees |
| CURV | streamline curvature  = neg.,  = pos. | 1/inches |
| VM | meridional velocity | ft/sec |
| CU | absolute tangential velocity | ft/sec |
| ALPHAM | absolute flow angle on stream surface | degrees |
| MM | meridional Mach number | |
| SL | calculation streamline number | |
| BLDBLK | flow blockage factor | (free area - blocked area)/free area |
| PS | static pressure | psia |
| PT | total pressure | psia |
| TT | total temperature | degrees |
| BETAM | relative flow angle on stream surface | degrees |
| UREL | relative velocity | ft/sec |
| MREL | relative Mach number | |
| VABS | absolute velocity | ft/sec |
| MABS | absolute Mach number | |
| GAMMA | specific heat ratio | |
| PT-RAT | total pressure/inlet total pressure | |
| TT-RAT | total temperature/inlet total temperature | |
| RCU | radius x tangential velocity | in-ft/sec |
| CZ | axial velocity | ft/sec |
| PCT IMM | percent annulus immersion from tip (OD) | |
| RAD | average of leading and trailing edge streamline radii | inches |
| ACC PT RATIO | cumulative total pressure ratio | |
| ACC TT RATIO | cumulative total temperature ratio | |

LIST OF SYMBOLS AND ABBREVIATIONS

1. Used in Circumferential Average Flow Output Tables (Cont'd)

| | |
|----------------|---------------------------------------|
| AD. | adiabatic efficiency |
| POLY | polytropic efficiency |
| Axial VEL R | axial velocity ratio across blade row |

2. Used in Stream Surface Blade Coordinate Tables

| | | |
|-------|---|---------|
| PT | point number | |
| PCT X | fraction of meridional distance from leading edge | |
| X | meridional coordinate on meanline | inches |
| Y | tangential coordinate on meanline | inches |
| B*M | meanline angle on stream surface | degrees |
| T(M) | thickness of blade perpendicular to meanline | inches |
| XS | meridional coordinate on suction surface | inches |
| YS | tangential coordinate on suction surface | inches |
| XP | meridional coordinate on pressure surface | inches |
| YP | tangential coordinate on pressure surface | inches |

3. Used in Plane Section Coordinate Tables

| | | |
|---------|--|---------|
| Z | axial coordinate of stacking axis | inches |
| R | radius of coordinate system origin | inches |
| MU | tilt angle in axial direction | degrees |
| ETA | tilt angle in tangential direction | degrees |
| RHO | section height | inches |
| PT | point number | |
| ALPHA | axial coordinate | inches |
| ZETA* | meanline angle from axial | degrees |
| UPSILON | coordinate perpendicular to ALPHA and radius | inches |
| PCT AL | fraction of axial distance from leading edge | |
| T/C | local thickness/chord ratio | |

SECTION XIII

DESIGN OF PHASE III ROTOR

1. INTRODUCTION

The efficiency of a transonic rotor is influenced by shock losses as well as losses due to cascade diffusion and secondary flow effects. The magnitude of the shock losses increases rapidly as the inlet Mach number increases. The average Mach number just ahead of the leading edge passage shock is influenced by the shape of the blade suction surface ahead of the shock. Increasing the average suction surface angle ahead of the shock reduces the average Mach number ahead of the shock and presumably reduces the shock losses. However, this results in a reduced cascade throat area. If the throat is too small, the cascade will not pass the design flow and may not achieve the attached shock pattern which is desired for minimum loss.

Also if the blade suction surface angle is made steep ahead of the cascade mouth, or covered portion, it may be necessary to have a rapid change in blade meanline angle at the cascade mouth to prevent the throat from becoming too small within the covered channel. A rapid change of suction surface angle increases the surface Mach number ahead of the shock and tends to worsen the shock-boundary layer interaction. This consideration may influence the optimum throat margin for best efficiency.

For cascades having an inlet Mach number greater than about 1.3, it is possible to achieve a net precompression of the flow ahead of the passage shock and still maintain a throat area sufficiently large to pass the flow.

The maximum flow that a transonic cascade can pass is set by the average suction surface angle in the flow induction region ahead of the first captured Mach wave, provided that the throat area is sufficient and not limiting. Hence any increase in suction surface angle must take place aft of the flow induction region or there will be a reduction of flow.

To get more definitive data on the effect of the suction surface shape ahead of the leading edge passage shock, and on the interrelation of the suction surface shape and the cascade throat area, the Phase III and the Phase IV blades were designed to have smaller throat areas in the outer 80% of the blade than the baseline rotor. While the throat areas of the Phase III and Phase IV rotors

were essentially the same, the Phase IV blade has some what less external compression and some what more internal compression. As a result, the Phase III blade has greater suction surface (and meanline) curvatures in the region of the cascade mouth than does either the Phase IV or the baseline rotors.

2. DESIGN PROCEDURE

The "data match" circumferential average flow solution and the Stream Surface Blade Sections (SBS) analysis of the baseline rotor previously described in Volume I were used as a starting point for the design of the Phase III rotor. However, a higher efficiency was assumed for the outer 80% of the flow since it was believed that the Phase III blade should have reduced shock losses and increased efficiency in this region. The rotor exit total pressure was maintained the same as the baseline rotor while the total temperature was reduced to reflect the assumed higher efficiency. The assumed chord-wise distribution of work was iteratively adjusted to obtain a calculated chord-wise distribution of static pressure which had a shape similar to that of the data match calculations of the base line rotor. However, the level of static pressure was higher in the outer portion at the rotor exit as a result of the assumed higher efficiency and consequent reduced energy input of the Phase III rotor. The resulting streamline static pressure distribution for the Phase III blade is compared with the data match of the baseline rotor on Figure 44.

The assumed streamline work input (as a fraction of the total streamline work) is plotted versus percent axial projection in Figure 45. The tip streamline is the one on the left. Each subsequent streamline is indexed to the right by the value of its stream function (fraction of the total flow from the tip). The dashed lines are lines of constant percent axial projection.

The blade meanline departure angles (the difference between the air angle and the meanline angle) were adjusted to achieve the desired suction surface contour in the forward part of the blade and yet maintain sufficient throat area to pass the desired flow.

After each modification to the chordwise work distribution and/or departure angles, revised blade annulus blockage and blade lean angles were calculated and input to the circumferential Average Flow Determination (CAFD) computer program

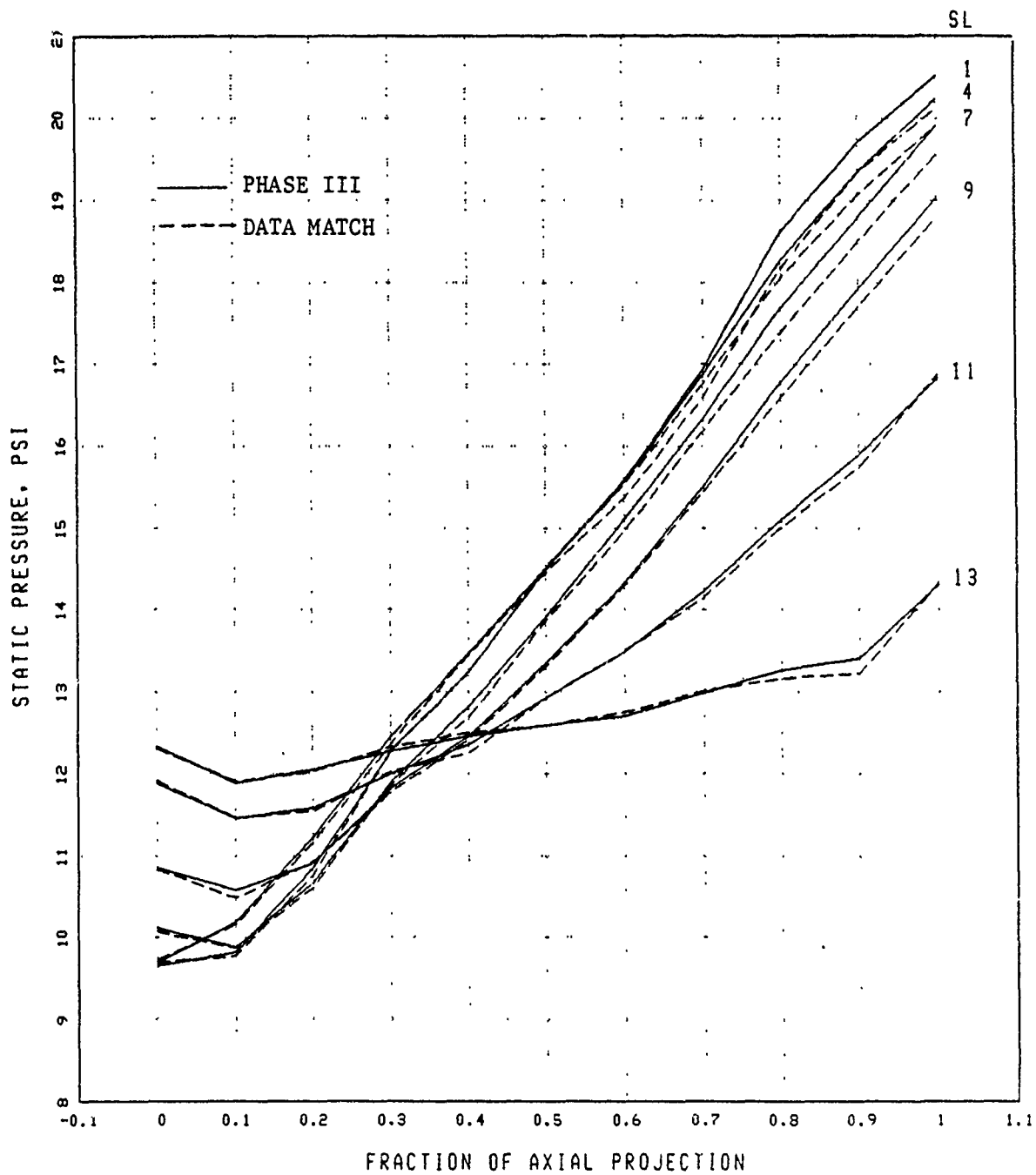


Figure 44 . Phase III Rotor Static Pressure Distribution

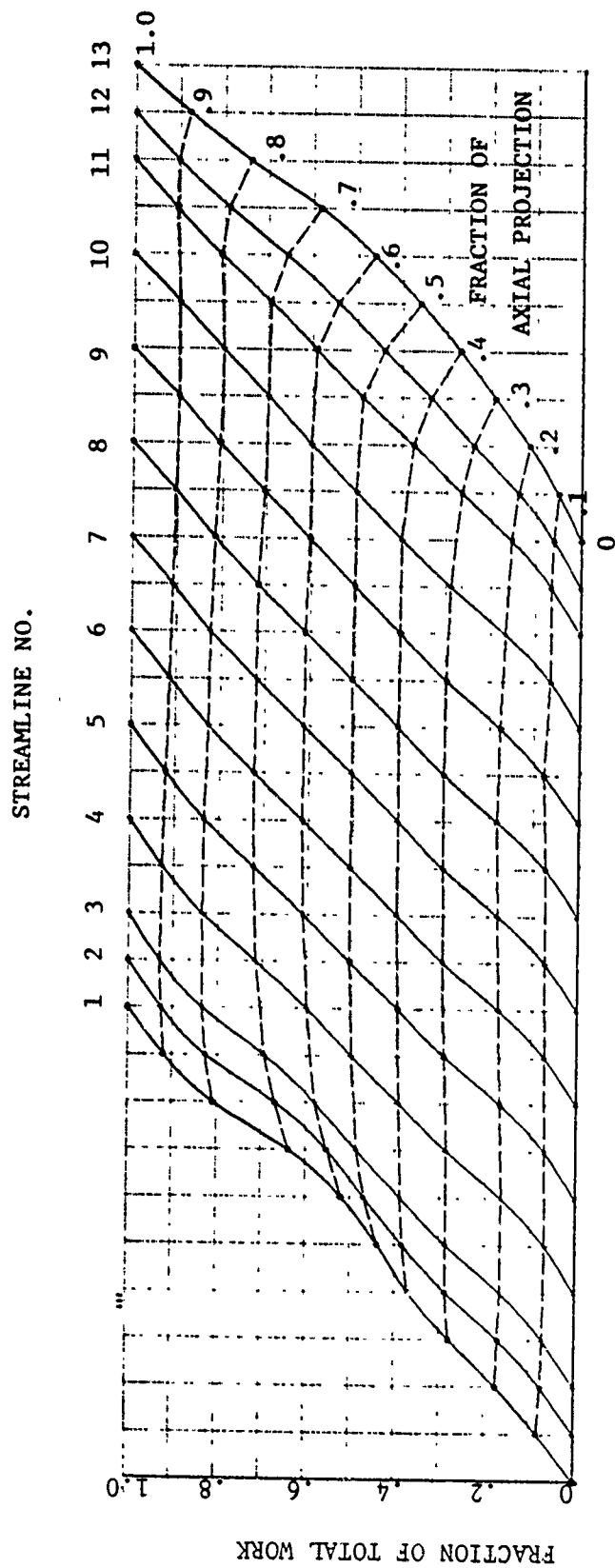


Figure 45. Phase III Rotor Intrablade Work Distribution

for the next iteration.

A method of characteristics computer program was used to analyze the flow in the cascade flow induction region for streamlines 3 and 6 to assure that the rotor would achieve the design flow. For other streamlines the differences between the suction surface angle and the "free-flow" streamline angle was compared with similar data from the data match calculations of the baseline rotor. This, then, was used as a guide in setting the suction surface angle in the flow induction region.

Figure 46 shows the radial distribution of the Phase III rotor throat margin compared with the data match case. It can be seen that the throat margin was set at essentially 5 percent in the outer 80 percent of the blade, except for locally at the tip where the margin is a little over 6 percent. The throat margin for a streamsurface blade section is defined here as the percent of excess throat area over and above the minimum theoretical area required to pass the streamtube flow at a throat Mach number of 1.0 and assuming a total pressure loss equivalent to a normal shock at the upstream Mach number. In a rotor the effect of radius change (between the leading edge and throat) on the relative total enthalpy and pressure is included.

The radial variation of incidence angle for the Phase III blade is shown on Figure 47. Since the blade thickness distribution and leading edge wedge angle are the same as the baseline rotor, the incidence angles were kept very close to the data match values of the base line rotor.

A modified version of Carter's Rule was used to calculate a reference deviation angle for the baseline rotor. This procedure converts the vector diagrams (from the data match calculations) to an equivalent two-dimensional set of vectors which would produce the same circulation as the actual blade taking into account the change in streamline radius and meridional velocity. The difference between the deviation angle implied by the data match calculations and the reference deviation angle was then added to the reference deviation angle calculated from the modified Carter's Rule for the Phase III blade.

The radial distribution of the Phase III rotor deviation angle is shown on Figure 48 and the deviation angle minus the reference deviation angle is compared with the data match values in Figure 49.

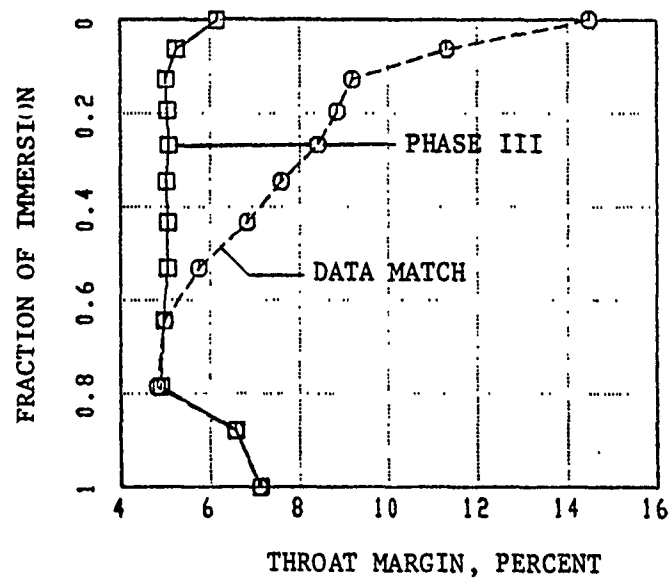


Figure 46. Phase III Rotor Throat Margin Compared With Data Match

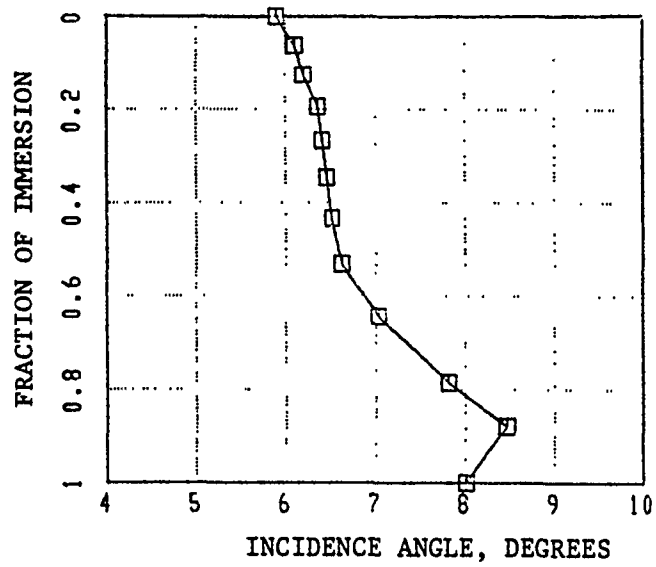


Figure 47. Phase III Rotor Incidence Angle Versus Fractional Immersion

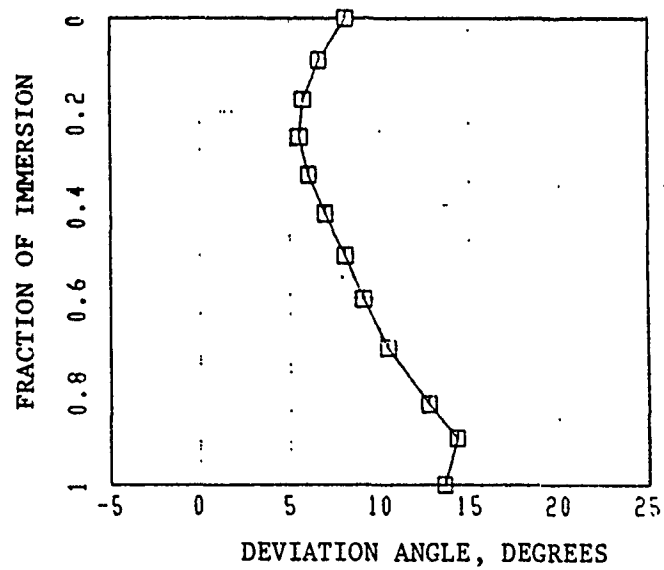


Figure 48. Phase III Rotor Deviation Angle Versus Fractional Immersion

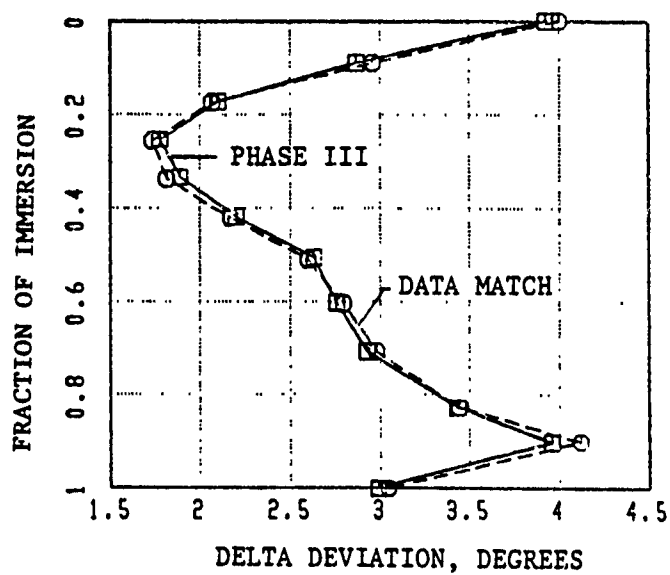


Figure 49. Phase III Rotor Deviation Angle Minus Reference Deviation Angle Compared With Data Match

A plot of departure angles for each streamsurface section is shown in Figure 50. Once the intralade work distribution was chosen these departure angles were required to satisfy the desired incidence angles, deviation angles, and passage area ratios. The resulting streamsurface tip section of the Phase III rotor is compared to that of the baseline rotor in Figure 51.

The radial distribution of the stator incidence angle for the Phase III rotor is compared with the data match of the base line rotor in Figure 52. The lower stator incidence angle in the outer 40 percent of span for the Phase III design is largely the result of the assumed higher efficiency in the outer portion of the rotor.

Details of the Phase III rotor design are given in Section XV.

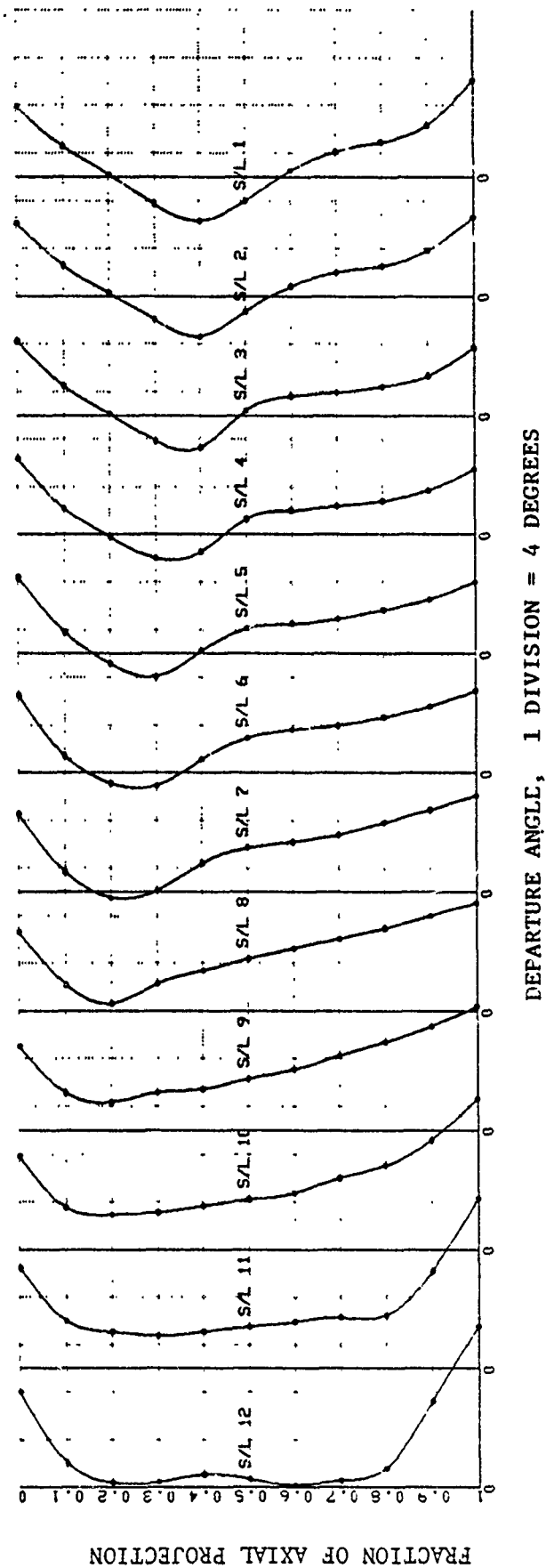


Figure 50 . Phase III Rotor Intrablade Departure Angle Distribution

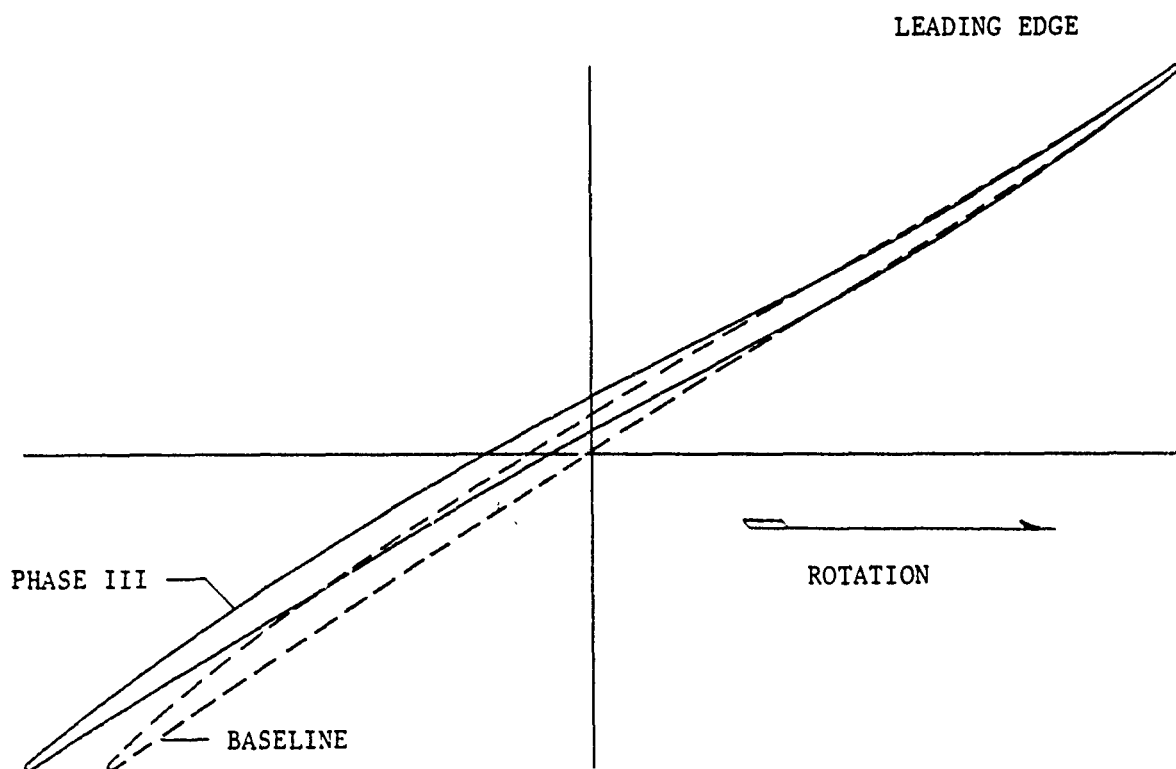


Figure 51 . Phase III Rotor Streamsurface Tip Section Compared with Baseline Design

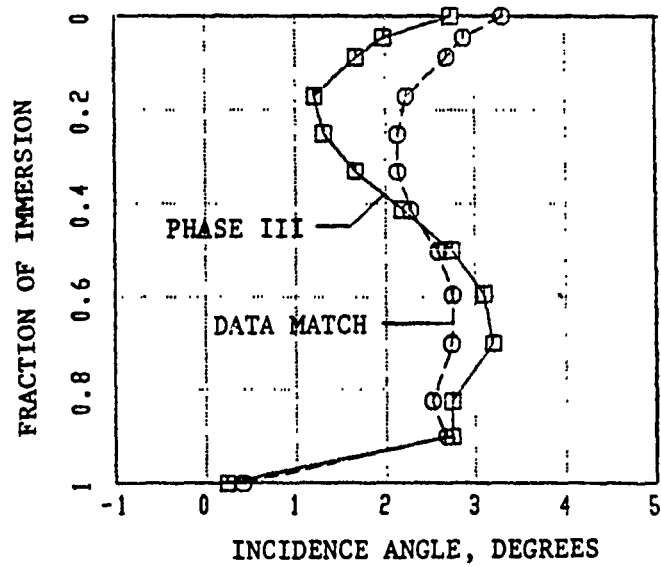


Figure 52. Phase III Stator Incidence Angle Compared With Data Match

SECTION XIV
DETAILS OF PHASE III ROTOR DESIGN

1. CIRCUMFERENTIAL AVERAGE FLOW SOLUTION

The following tabulation presents the detail results of the Phase III rotor circumferential average flow computation. Each page of the tabulation gives results for one calculation station. Figure 53 shows the calculation station locations within the gas flowpath. At each calculation station various aerodynamic parameters are given on each of thirteen calculation streamlines. Also given are several mass averaged station flow properties.

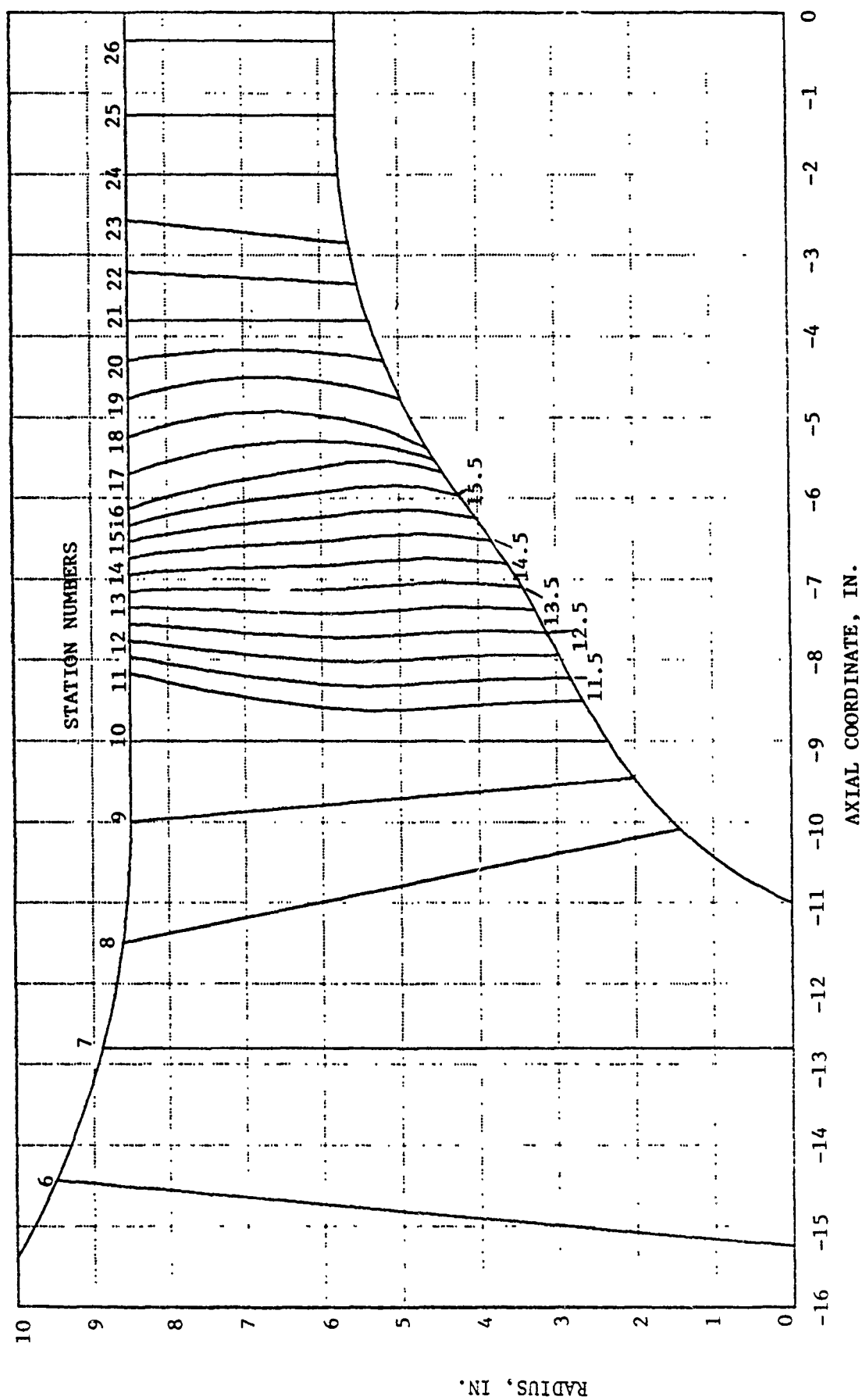


Figure 53. Compressor Flowpath With Calculation Stations

INLET STA= 5.000
 WIF= 61.365 I= 1 AFLOW= 478 13 D+C=0. FREE
 MTIP= 1 OPTI=FREE ITYPE=0 INNR=0 ABC=0. ARI=0
 PSIC Z R PHI CURV VM CU ALPHAM MM
 0. -18.800 13.207 -50.10 0.0831 150.4 0. 0. 0.135
 0.050 -18.800 12.564 -43.54 0. 181.0 0. 0. 0.163
 0.100 -18.800 12.020 -40.31 0. 195.9 0. 0. 0.176
 0.200 -18.800 11.027 -34.70 0. 218.6 0. 0. 0.196
 0.300 -18.800 10.099 -29.90 0. 237.1 0. 0. 0.213
 0.400 -18.800 9.193 -25.65 0. 252.4 0. 0. 0.227
 0.500 -18.800 8.277 -21.78 0. 265.1 0. 0. 0.239
 0.600 -18.800 7.319 -18.17 0. 275.9 0. 0. 0.248
 0.700 -18.800 6.277 -14.68 0. 284.9 0. 0. 0.257
 0.800 -18.800 5.083 -11.19 0. 292.5 0. 0. 0.264
 0.900 -18.800 3.569 -7.35 0. 298.9 0. 0. 0.270
 0.950 -18.800 2.516 -4.92 0. 301.6 0. 0. 0.272
 1.000 -18.800 0.000 0. 304.0 0. 0. 0.274

SL BLDLCK PS PT TT BETAM VREL MREL VABS MABS
 1 0.997 14.510 14.696 518.7 86.31 2335.4 2.095 150.4 0.135
 2 0.997 14.427 14.696 518.7 85.33 2224.5 1.997 181.0 0.163
 3 0.997 14.382 14.696 518.7 84.72 2130.2 1.913 195.9 0.176
 4 0.997 14.305 14.696 518.7 83.59 1958.1 1.760 218.6 0.196
 5 0.997 14.237 14.696 518.7 82.42 1797.9 1.617 237.1 0.213
 6 0.997 14.177 14.696 518.7 81.16 1641.9 1.477 252.4 0.227
 7 0.997 14.124 14.696 518.7 79.71 1484.6 1.337 265.1 0.239
 8 0.997 14.077 14.696 518.7 77.94 1320.6 1.190 275.9 0.248
 9 0.997 14.037 14.696 518.7 75.58 1143.7 1.031 284.9 0.257
 10 0.997 14.002 14.696 518.7 71.94 943.5 0.850 292.5 0.264
 11 0.997 13.972 14.696 518.7 64.61 697.2 0.629 298.9 0.270
 12 0.997 13.959 14.696 518.7 55.81 536.8 0.484 301.6 0.272
 13 0.997 13.947 14.696 518.7 0.00 304.0 0.274

STA 5.000 MASS AVERAGED PROPERTIES
 PT= 14.696 TT= 518.69 GAMMA=1.4015 PT-RAT= 1.000 TT-RAT= 1.000
 RCU= 0. VM= 255.3 CZ= 233.4 MM=0.230 MABS=0.230 MREL=1.300

| INLET | | | | | | | | | | STA= 6.000 | | | | | | | | | | AFLOW= 277.56 | | | | | | | | | | D+C=0. | | | | | | | | | | FRFE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|--------|--------|--------|-------|-------|--------|-------|-------|-------|------------|--|--|--|--|--|--|--|--|--|---------------|--|--|--|--|--|--|--|--|--|---------|--|--|--|--|--|--|--|--|--|---------|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|--|--|
| WTF= 61.365 | | | | | | | | | | I= 2 | | | | | | | | | | OPTV=FREE | | | | | | | | | | ITYPE=0 | | | | | | | | | | VM | | | | | | | | | | CU | | | | | | | | | | ALPHAM | | | | | | | | | | D+H-O. | | | | | | | | | | | | | | | | | | | |
| PSIC | | | | | | | | | | Z | | | | | | | | | | R | | | | | | | | | | PHI | | | | | | | | | | CURV | | | | | | | | | | INRR=0 | | | | | | | | | | ABC=0. | | | | | | | | | | ABH=0. | | | | | | | | | | | | | | | | | | | |
| 0. | | | | | | | | | | -14.431 | | | | | | | | | | 9.481 | | | | | | | | | | -24.96 | | | | | | | | | | -0.0952 | | | | | | | | | | 514.6 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.471 | | | | | | | | | |
| 0.050 | | | | | | | | | | -14.450 | | | | | | | | | | 9.254 | | | | | | | | | | -24.10 | | | | | | | | | | -0.1028 | | | | | | | | | | 507.6 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.464 | | | | | | | | | |
| 0.100 | | | | | | | | | | -14.470 | | | | | | | | | | 9.020 | | | | | | | | | | -22.95 | | | | | | | | | | -0.0955 | | | | | | | | | | 501.1 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.452 | | | | | | | | | |
| 0.200 | | | | | | | | | | -14.513 | | | | | | | | | | 8.532 | | | | | | | | | | -20.65 | | | | | | | | | | -0.0825 | | | | | | | | | | 489.4 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.447 | | | | | | | | | |
| 0.300 | | | | | | | | | | -14.558 | | | | | | | | | | 8.010 | | | | | | | | | | -18.38 | | | | | | | | | | -0.0712 | | | | | | | | | | 478.4 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.436 | | | | | | | | | |
| 0.400 | | | | | | | | | | -14.606 | | | | | | | | | | 7.446 | | | | | | | | | | -16.13 | | | | | | | | | | -0.0614 | | | | | | | | | | 467.8 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.426 | | | | | | | | | |
| 0.500 | | | | | | | | | | -14.660 | | | | | | | | | | 6.829 | | | | | | | | | | -13.87 | | | | | | | | | | -0.0529 | | | | | | | | | | 457.2 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.416 | | | | | | | | | |
| 0.600 | | | | | | | | | | -14.719 | | | | | | | | | | 6.141 | | | | | | | | | | -11.59 | | | | | | | | | | -0.0455 | | | | | | | | | | 446.4 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.406 | | | | | | | | | |
| 0.700 | | | | | | | | | | -14.787 | | | | | | | | | | 5.352 | | | | | | | | | | -9.23 | | | | | | | | | | -0.0390 | | | | | | | | | | 434.9 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.395 | | | | | | | | | |
| 0.800 | | | | | | | | | | -14.869 | | | | | | | | | | 4.402 | | | | | | | | | | -6.73 | | | | | | | | | | -0.0330 | | | | | | | | | | 422.1 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.383 | | | | | | | | | |
| 0.900 | | | | | | | | | | -14.978 | | | | | | | | | | 3.142 | | | | | | | | | | -4.03 | | | | | | | | | | -0.0257 | | | | | | | | | | 406.9 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.369 | | | | | | | | | |
| 0.950 | | | | | | | | | | -15.057 | | | | | | | | | | 2.234 | | | | | | | | | | -2.57 | | | | | | | | | | -0.0190 | | | | | | | | | | 398.1 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.361 | | | | | | | | | |
| 1.000 | | | | | | | | | | -15.250 | | | | | | | | | | 0.000 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 387.5 | | | | | | | | | | 0. | | | | | | | | | | 0. | | | | | | | | | | 0.351 | | | | | | | | | |
| SL | BIDBLK | PS | PT | IT | BETAM | VREL | MREL | VABS | MABS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0.997 | 12.623 | 14.696 | 518.7 | 72.90 | 1750.4 | 1.601 | 514.6 | 0.471 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0.997 | 12.677 | 14.696 | 518.7 | 72.73 | 1710.1 | 1.564 | 507.6 | 0.464 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0.997 | 12.726 | 14.696 | 518.7 | 72.53 | 1668.8 | 1.525 | 501.1 | 0.458 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0.997 | 12.812 | 14.696 | 518.7 | 71.99 | 1583.2 | 1.445 | 489.4 | 0.447 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 0.997 | 12.892 | 14.696 | 518.7 | 71.30 | 1492.2 | 1.361 | 478.4 | 0.436 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0.997 | 12.968 | 14.696 | 518.7 | 70.41 | 1394.8 | 1.271 | 467.8 | 0.426 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 0.997 | 13.042 | 14.696 | 518.7 | 69.22 | 1288.9 | 1.174 | 457.2 | 0.416 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 0.997 | 13.116 | 14.696 | 518.7 | 67.61 | 1172.0 | 1.066 | 446.4 | 0.406 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 0.997 | 13.193 | 14.696 | 518.7 | 65.27 | 1039.7 | 0.945 | 434.9 | 0.395 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 0.997 | 13.277 | 14.696 | 518.7 | 61.48 | 884.2 | 0.803 | 422.1 | 0.383 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | 0.997 | 13.374 | 14.696 | 518.7 | 53.72 | 687.7 | 0.624 | 406.9 | 0.369 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 0.997 | 13.429 | 14.696 | 518.7 | 44.72 | 560.3 | 0.508 | 398.1 | 0.361 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | 0.997 | 13.493 | 14.696 | 518.7 | 0.00 | 387.5 | 0.351 | 387.5 | 0.351 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

STA 6.000 MASS AVERAGED PROPERTIES
PT= 14.696 IT= 518.69 GAMMA=1.4016 PT-RAT= 1.000 TT-RAT= 1.000
RCU= 0. VM= 455.5 CZ= 438.5 MM=0.415 MABS=0.415 MREL=1.120

| INLET | | I = 3 | | STA = 7.000 | | AFLOW = 244.35 | | D+C=0. | | FREE | |
|--------------|--------|----------|--------|-------------|-------|----------------|-------|---------|-------|--------|--|
| WTF = 61.365 | | OP1X=DPP | | MTIP = 27 | | ITYPE=0 | | INRR=0 | | D+H=0. | |
| PSIC | | Z | | PHI | | CURV | | VM | | CU | |
| 0 | | -12.800 | | 8.880 | | -15.47 | | -0.0952 | | 625.2 | |
| 0.050 | | -12.800 | | 8.675 | | -14.65 | | -0.0872 | | 617.8 | |
| 0.100 | | -12.800 | | 8.464 | | -13.90 | | -0.0849 | | 610.4 | |
| 0.200 | | -12.800 | | 8.021 | | -12.40 | | -0.0753 | | 595.1 | |
| 0.300 | | -12.800 | | 7.546 | | -10.86 | | -0.0736 | | 579.6 | |
| 0.400 | | -12.800 | | 7.032 | | -9.28 | | -0.0680 | | 563.9 | |
| 0.500 | | -12.800 | | 6.468 | | -7.60 | | -0.0629 | | 547.6 | |
| 0.600 | | -12.800 | | 5.837 | | -5.79 | | -0.0587 | | 530.4 | |
| 0.700 | | -12.800 | | 5.112 | | -3.79 | | -0.0560 | | 511.3 | |
| 0.800 | | -12.800 | | 4.237 | | -1.46 | | -0.0558 | | 488.4 | |
| 0.900 | | -12.800 | | 3.064 | | 1.52 | | -0.0633 | | 455.8 | |
| 0.950 | | -12.800 | | 2.206 | | 3.55 | | -0.0759 | | 428.6 | |
| 1.000 | | -12.800 | | 0.000 | | 0. | | 0. | | 383.6 | |
| SL | BLOBLK | PS | PT | TT | BETAM | VREL | MREL | VABS | MABS | | |
| 1 | 0.998 | 11.714 | 14.696 | 518.7 | 68.25 | 1687.2 | 1.560 | 625.2 | 0.578 | | |
| 2 | 0.998 | 11.779 | 14.696 | 518.7 | 68.02 | 1650.8 | 1.525 | 617.8 | 0.571 | | |
| 3 | 0.998 | 11.843 | 14.696 | 518.7 | 67.77 | 1613.5 | 1.490 | 610.4 | 0.564 | | |
| 4 | 0.998 | 11.974 | 14.696 | 518.7 | 67.20 | 1535.5 | 1.415 | 595.1 | 0.549 | | |
| 5 | 0.998 | 12.105 | 14.696 | 518.7 | 66.48 | 1452.4 | 1.337 | 579.6 | 0.533 | | |
| 6 | 0.998 | 12.235 | 14.696 | 518.7 | 65.56 | 1363.1 | 1.253 | 563.9 | 0.518 | | |
| 7 | 0.998 | 12.366 | 14.696 | 518.7 | 64.37 | 1266.0 | 1.162 | 547.6 | 0.502 | | |
| 8 | 0.998 | 12.502 | 14.696 | 518.7 | 62.76 | 1158.6 | 1.061 | 530.4 | 0.486 | | |
| 9 | 0.998 | 12.649 | 14.696 | 518.7 | 60.46 | 1036.9 | 0.948 | 511.3 | 0.468 | | |
| 10 | 0.998 | 12.819 | 14.696 | 518.7 | 56.85 | 893.0 | 0.815 | 488.4 | 0.446 | | |
| 11 | 0.998 | 13.051 | 14.696 | 518.7 | 49.87 | 707.2 | 0.644 | 455.8 | 0.415 | | |
| 12 | 0.998 | 13.234 | 14.696 | 518.7 | 42.25 | 579.0 | 0.526 | 428.6 | 0.390 | | |
| 13 | 0.998 | 13.517 | 14.696 | 518.7 | 0.00 | 383.6 | 0.348 | 383.6 | 0.348 | | |

STA 7.000 MASS AVERAGED PROPERTIES
PT = 14.696 TT = 518.69 GAMMA = 1.4017 PT-RAT = 1.000 TT-RAT = 1.000
RCU = 0. VM = 539.1 CZ = 532.1 MM = 0.495 MABS = 0.495 MREL = 1.109

INLET STA= 8.000 AFLOW= 224.07 D+C=0. FREE D+H=0.0
 WTF= 61.365 OPTX=OPP R PHIL CURV VM INBR=0 ABC=0. ABH=0.0
 PSIC Z R PHIL CURV VM INBR=0 ABC=0. ABH=0.0

| | | | | | | | | |
|-------|---------|-------|-------|---------|-------|----|----|-------|
| 0 | -11.499 | 8.608 | -8.21 | -0.0953 | 712.0 | 0. | 0. | 0.665 |
| 0.050 | -11.461 | 8.412 | -7.49 | -0.0964 | 703.2 | 0. | 0. | 0.656 |
| 0.100 | -11.421 | 8.211 | -6.86 | -0.0909 | 693.2 | 0. | 0. | 0.647 |
| 0.200 | -11.339 | 7.790 | -5.58 | -0.0816 | 675.7 | 0. | 0. | 0.628 |
| 0.300 | -11.250 | 7.341 | -4.24 | -0.0744 | 658.7 | 0. | 0. | 0.611 |
| 0.400 | -11.155 | 6.858 | -2.77 | -0.0695 | 642.1 | 0. | 0. | 0.595 |
| 0.500 | -11.052 | 6.333 | -1.09 | -0.0668 | 625.0 | 0. | 0. | 0.578 |
| 0.600 | -10.938 | 5.753 | 0.90 | -0.0667 | 606.2 | 0. | 0. | 0.559 |
| 0.700 | -10.809 | 5.096 | 3.37 | -0.0695 | 583.8 | 0. | 0. | 0.538 |
| 0.800 | -10.656 | 4.320 | 6.70 | -0.0768 | 554.5 | 0. | 0. | 0.509 |
| 0.900 | -10.459 | 3.318 | 12.11 | -0.0934 | 510.5 | 0. | 0. | 0.467 |
| 0.950 | -10.323 | 2.629 | 17.76 | -0.1212 | 468.0 | 0. | 0. | 0.427 |
| 1.000 | -10.086 | 1.421 | 47.99 | 0.1910 | 433.9 | 0. | 0. | 0.394 |

SL ELOBLK PS PT TT BETAM VREL MREL VABS MABS
 1 0.997 10.919 14.696 518.7 64.89 1677.6 1.567 712.0 0.665
 2 0.997 11.003 14.696 518.7 64.65 1642.6 1.533 703.2 0.656
 3 0.997 11.092 14.696 518.7 64.41 1506.5 1.497 693.8 0.647
 4 0.997 11.259 14.696 518.7 63.82 1531.8 1.425 675.7 0.628
 5 0.997 11.415 14.696 518.7 63.05 1453.3 1.349 658.7 0.611
 6 0.997 11.564 14.696 518.7 62.05 1370.1 1.269 642.1 0.595
 7 0.997 11.716 14.696 518.7 60.78 1280.6 1.184 625.0 0.578
 8 0.997 11.879 14.696 518.7 59.16 1182.5 1.091 606.2 0.559
 9 0.997 12.070 14.696 518.7 57.01 1072.2 0.987 583.8 0.538
 10 0.997 12.311 14.696 518.7 53.97 942.6 0.865 554.5 0.509
 11 0.997 12.655 14.696 518.7 48.91 776.8 0.710 510.5 0.467
 12 0.997 12.966 14.696 518.7 44.75 659.0 0.601 468.0 0.427
 13 0.997 13.200 14.696 518.7 30.03 501.2 0.456 433.9 0.394

STA 8.000 MASS AVERAGED PROPERTIES
 PT= 14.696 TT= 518.69 GAMMA=1.4017 PT-RAT= 1.000 TT-RAT= 1.000
 RCU= 0. VM= 612.1 CZ= 604.7 MM=0.566 MABS=0.566 MREL=1.140

| INIT ET | | STA= 10.000 | | AFLOW= 204.13 | | FREE | |
|-------------|--------|-------------|-------|---------------|-------|--------|-------|
| WIF= 61.365 | | I= 6 | | ITIP= 66 | | D+C=O. | |
| PSIC | | OPTX=DDPP | | PHI | | D+C=O. | |
| Z | | R | | CURV | | CU | |
| P | | R | | VM | | ALPHAM | |
| MM | | MM | | MM | | MM | |
| 0. | -9.000 | 8.500 | 0. | 0. | 774.8 | 0. | 0.730 |
| 0.050 | -9.000 | 8.317 | 0.34 | 0.0031 | 775.1 | 0. | 0.730 |
| 0.100 | -9.000 | 8.130 | 0.65 | -0.0024 | 775.0 | 0. | 0.730 |
| 0.200 | -9.000 | 7.743 | 1.46 | -0.0129 | 772.3 | 0. | 0.727 |
| 0.300 | -9.000 | 7.333 | 2.52 | -0.0224 | 765.8 | 0. | 0.720 |
| 0.400 | -9.000 | 6.897 | 3.91 | -0.0326 | 754.8 | 0. | 0.709 |
| 0.500 | -9.000 | 6.425 | 5.65 | -0.0422 | 738.5 | 0. | 0.692 |
| 0.600 | -9.000 | 5.906 | 7.94 | -0.0578 | 714.6 | 0. | 0.668 |
| 0.700 | -9.000 | 5.320 | 10.76 | -0.0720 | 680.6 | 0. | 0.633 |
| 0.800 | -9.000 | 4.625 | 14.37 | -0.0853 | 634.6 | 0. | 0.587 |
| 0.900 | -9.000 | 3.734 | 19.55 | -0.0855 | 575.6 | 0. | 0.530 |
| 0.950 | -9.000 | 3.141 | 23.74 | -0.0851 | 535.8 | 0. | 0.491 |
| 1.000 | -9.000 | 2.340 | 32.46 | 0.1922 | 543.6 | 0. | 0.499 |

| SL | | BLDBLK | | PS | | PT | | TT | | BETAM | | VREL | | MREL | | VABS | | MABS | |
|----|-------|--------|--------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 0.994 | 10.309 | 14.696 | 518.7 | 62.68 | 1688.3 | 1.590 | 774.8 | 0.730 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 |
| 2 | 0.994 | 10.306 | 14.696 | 518.7 | 62.16 | 1659.8 | 1.563 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 3 | 0.994 | 10.306 | 14.696 | 518.7 | 61.62 | 1630.7 | 1.536 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 4 | 0.994 | 10.333 | 14.696 | 518.7 | 60.52 | 1569.5 | 1.478 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 5 | 0.994 | 10.398 | 14.696 | 518.7 | 59.39 | 1503.7 | 1.414 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 6 | 0.994 | 10.506 | 14.696 | 518.7 | 58.19 | 1432.1 | 1.345 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 7 | 0.994 | 10.665 | 14.696 | 518.7 | 56.92 | 1353.2 | 1.268 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 8 | 0.994 | 10.895 | 14.696 | 518.7 | 55.57 | 1263.7 | 1.181 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 9 | 0.994 | 11.214 | 14.696 | 518.7 | 54.06 | 1159.5 | 1.079 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 10 | 0.994 | 11.631 | 14.696 | 518.7 | 52.13 | 1033.9 | 0.957 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 11 | 0.994 | 12.138 | 14.696 | 518.7 | 48.86 | 874.9 | 0.805 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 12 | 0.994 | 12.459 | 14.696 | 518.7 | 45.97 | 771.0 | 0.707 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |
| 13 | 0.994 | 12.398 | 14.696 | 518.7 | 37.22 | 682.6 | 0.626 | 775.1 | 0.730 | 775.0 | 0.730 | 772.3 | 0.727 | 765.8 | 0.720 | 754.8 | 0.709 | 754.8 | 0.709 |

STA 10.000 MASS AVERAGED PROPERTIES
PT= 14.696 TT= 518.69 GAMMA=1.4018 PT-RAT= 1.000 IT-RAT= 1.000
RCU= 0. VM= 705.9 CZ= 694.5 MM=0.660 MABS=0.660 MREL=1.217

| ROTOR1 | | STA= 11.000 | | | | LE ROTOR | | | |
|-------------|--|-------------|--|---------------|--|----------|--|--------|--|
| WTF= 61.365 | | I= 7 | | AFLOW= 197.36 | | D+C=O. | | D*H=O. | |
| PSIC | | QPTX=DPP | | PHI | | CURV | | INBR=3 | |
| | | Z | | R | | ITYPE=4 | | VM | |
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ROTOR1 STA= 11 500
 WTF= 61 365 I= 8 MTIP= 92 AFLOW= 180.99 D+C=O. D+H=O.
 PSIC Z OPTX=TT PHI OPTV=PT ITYPE=5 INBR=3 ABC=O. ABH=O.
 IN ROTOR
 0 -7.963 8.500 0 0 0 848 4 45 6 3 08 0.798
 0 050 -7.991 8.324 0 30 0 0205 851.7 41.3 2.77 0 803
 0 100 -8.020 8.143 0 68 0 0182 859.3 39.2 2 62 0 811
 0 200 -8.083 7.770 1.73 0 0098 875.2 37.6 2 46 0 829
 0 300 -8.143 7.378 3.29 -0 0050 887 0 39.6 2 56 0 842
 0 400 -8.198 6.962 5.22 -0 0149 886.2 42.0 2 71 0 841
 0 500 -3.251 6.512 7.38 -0 0134 874.7 44.9 2 94 0 828
 0 600 -8.301 6.017 9.83 -0 0279 846.7 47.5 3 21 0 799
 0 700 -8.324 5.464 12.83 -0 0052 813.8 56.0 3 94 0 764
 0 800 -8.299 4.824 16.59 0 0102 765.9 52.2 3 90 0 715
 0 900 -8.247 4.027 22.17 0 0134 714.1 61.7 4 93 0 662
 0 950 -8.231 3.508 25.98 0 0615 678.9 65.0 5 47 0 627
 1 000 -8.224 2.817 29.07 0 0800 654 0 68.9 6 01 0 603

SL BLDBLK PS PT TT BETAM VREL MREL VABS MABS
 1 0 955 10.182 15.513 530.1 59.75 1683.7 1.584 849.6 0.799
 2 0 955 10.102 15.460 528.8 59.18 1662.4 1.566 852.7 0.804
 3 0 954 10.003 15.440 528.1 58.42 1640.8 1.549 860.2 0.812
 4 0 952 9.820 15.432 527.3 56.72 1595.1 1.511 876.0 0.830
 5 0 948 9.718 15.474 527.3 54.91 1542.8 1.464 887.8 0.843
 6 0 942 9.745 15.506 527.3 53.25 1480.9 1.405 887.2 0.842
 7 0 934 9.881 15.525 527.3 51.62 1408.7 1.334 875.8 0.830
 8 0 925 10.175 15.518 527.1 50.15 1321.3 1.246 848.1 0.800
 9 0 914 10.573 15.587 527.7 48.14 1219.5 1.144 815.8 0.765
 10 0 899 10.954 15.430 526.1 46.22 1106.9 1.033 767.7 0.717
 11 0 881 11.459 15.419 526.0 42.26 964.9 0.895 716.8 0.665
 12 0 848 11.745 15.354 525.4 39.22 876.3 0.810 682.0 0.630
 13 0 810 11.888 15.248 524.4 33.22 781.7 0.721 657.6 0.607

STA 11.500 MASS AVERAGED PROPERTIES
 PT= 15.471 TT= 527.14 GAMMA=1.4018 PT-RAT= 1.053 TT-RAT= 1.016
 RCU= 287.0 VM= 827.0 CZ= 809.8 MM=0.779 MABS=0.780 MREL=1.274

ROTOR1 STA= 12.000
 WTF= 61.365 I= 9
 PSIC Z OPTX=TT
 OPTV=PT
 AFLOW= 170 36 D+C=O. D+H=O.
 I TYPE=5 INBR=3 ABC=O. ABH=O.
 CURV VM CU ALPHAM MM
 PHI
 O. -7.759 8.500 0. 817 0 96.7 6.75 0.755
 O.050 -7.778 8.324 -0.02 0.0326 822.8 94.3 6.54 0.762
 O.100 -7.798 8.145 0.33 0.0372 831.3 92.2 6.33 0.772
 O.200 -7.844 7.777 1.53 0.0187 852.1 92.2 6.18 0.794
 O.300 -7.889 7.393 3.22 0.141 871.3 97.0 6.35 0.814
 O.400 -7.931 6.987 5.29 0.0057 882.0 103.1 6.67 0.826
 O.500 -7.972 6.549 7.51 -0.0023 881.4 110.0 7.11 0.825
 O.600 -8.010 6.068 9.98 0.0103 875.1 118.7 7.73 0.819
 O.700 -8.024 5.532 12.79 0.0098 856.3 124.7 8.28 0.800
 O.800 -7.995 4.915 16.49 0.0006 820.5 131.4 9.10 0.763
 O.900 -7.946 4.149 21.85 0.0209 771.3 142.5 10.47 0.714
 O.950 -7.936 3.649 25.21 0.0211 736.4 147.2 11.30 0.680
 1.000 -7.941 2.971 28.21 0.0136 688.0 149.9 12.29 0.633

SL BLDLTK PS PT TT BETAM VREL MREL VABS MABS
 1 0.932 11.217 16.462 542.9 59.79 1623.8 1.501 822.7 0.761
 2 0.931 11.160 16.479 541.8 59.10 1602.1 1.484 826.2 0.767
 3 0.930 11.062 16.482 540.8 58.29 1581.3 1.468 836.4 0.776
 4 0.926 10.861 16.544 539.8 56.35 1537.9 1.433 857.1 0.799
 5 0.920 10.709 16.655 539.8 54.19 1489.2 1.392 876.7 0.820
 6 0.910 10.639 16.747 539.9 52.02 1433.3 1.342 888.0 0.831
 7 0.896 10.668 16.799 539.9 49.87 1367.6 1.281 888.3 0.832
 8 0.880 10.749 16.832 539.9 47.42 1293.2 1.210 883.1 0.826
 9 0.863 10.900 16.760 539.0 44.84 1207.7 1.128 865.4 0.808
 10 0.842 11.197 16.633 537.7 41.89 1102.2 1.026 830.9 0.773
 11 0.820 11.583 16.461 536.1 37.39 970.8 0.899 784.4 0.726
 12 0.774 11.801 16.281 534.5 34.00 888.3 0.820 751.0 0.693
 13 0.730 12.048 15.985 531.8 28.55 783.2 0.721 704.1 0.648

STA 12.000 MASS AVERAGED PROPERTIES
 PT= 16.616 TT= 539.05 GAMMA=1.4018 PT-RAT= 1.131 TT-RAT= 1.039
 RCU= 691.5 VM= 839.7 CZ= 821.8 MM=0.782 MABS=0.790 MREL=1.229

STA= 12 500
 MTIP=118
 OPTX=PT
 PHI=

| PSIC | Z | OPTX=TT | R | PHI | CURV | VM | CU | ALPHAM | MM |
|-------|--------|---------|-------|---------|--------|-------|-------|--------|-------|
| 0 | -7.556 | 8.500 | 0 | 0 | 0 | 778.4 | 155.1 | 11.27 | 0.706 |
| 0.050 | -7.565 | 8.323 | -0.26 | 0 | 0.0067 | 789.7 | 159.6 | 11.43 | 0.717 |
| 0.100 | -7.576 | 8.146 | -0.06 | 0 | 0.0240 | 796.2 | 159.8 | 11.35 | 0.725 |
| 0.200 | -7.606 | 7.783 | 1.09 | 0 | 0.0467 | 817.7 | 161.5 | 11.18 | 0.747 |
| 0.300 | -7.636 | 7.407 | 2.89 | 0 | 0.0320 | 840.3 | 168.4 | 11.33 | 0.771 |
| 0.400 | -7.664 | 7.011 | 4.99 | 0 | 0.0333 | 854.5 | 176.9 | 11.70 | 0.786 |
| 0.500 | -7.692 | 6.585 | 7.30 | 0 | 0.0281 | 862.5 | 185.2 | 12.12 | 0.795 |
| 0.600 | -7.720 | 6.119 | 9.74 | 0 | 0.0180 | 865.5 | 196.0 | 12.76 | 0.798 |
| 0.700 | -7.725 | 5.600 | 12.59 | 0 | 0.0135 | 858.0 | 208.7 | 13.67 | 0.792 |
| 0.800 | -7.690 | 5.005 | 16.27 | 0 | 0.0237 | 840.6 | 224.7 | 14.97 | 0.775 |
| 0.900 | -7.646 | 4.268 | 21.44 | 0 | 0.0242 | 805.9 | 239.6 | 16.56 | 0.742 |
| 0.950 | -7.641 | 3.786 | 24.93 | 0 | 0.0088 | 773.5 | 243.2 | 17.45 | 0.712 |
| 1.000 | -7.658 | 3.123 | 28.51 | -0.0461 | 712.6 | 236.1 | 236.1 | 18.33 | 0.654 |

STA= 12 500
 MASS AVERAGED PROPERTIES
 PT= 18.084
 TT= 553.54
 GAMMA=1.4017
 PT-RAT= 1.231
 TT-RAT= 1.067
 PCU= 1184.0
 VM= 829.5
 CZ= 811.7
 MM=0.762
 MABS=0.783
 MREL=1.160

ROTOR1 STA= 13 000
 WTF= 61 365 I=11 MIIP=131 AFLOW= 154.98 D+C=0. IN ROTOR
 PSIC Z R OPTX=TT PHI PT TT CURV VM CU ALPHAM MM D+H=0.
 0. -7 352 8.500 0 0 0 0.0450 767.9 212.8 15.49 0.688 ABH=0.
 0 050 -7 352 8.322 -0 57 0.0480 783.4 215.7 15.40 0.704
 0 100 -7 354 8.145 -0.52 0.0270 810.0 220.9 15.25 0.731
 0 200 -7 367 7.786 0.58 0.0323 830.6 227.2 15.30 0.753
 0 300 -7 382 7.418 2.42 0.0211 845.7 236.8 15.64 0.768
 0 400 -7 397 7.033 4.57 0.0261 853.1 245.9 16.08 0.777
 0 500 -7 413 6.620 6.86 0.0249 864.8 260.6 16.77 0.790
 0 600 -7 429 6.168 9.38 0.0169 868.7 277.7 17.73 0.796
 0 700 -7 425 5.666 12.32 0.0105 861.5 304.3 19.45 0.790
 0 800 -7 386 5.092 15.96 0.0098 833.0 327.8 21.48 0.764
 0 900 -7 344 4.385 21.12 -0.0155 804.2 328.3 22.21 0.738
 0 950 -7 346 3.923 24.99 -0.1052 736.3 319.0 23.42 0.674
 1.000 -7 375 3.281 29.92 -0.1052 736.3 319.0 23.42 0.674

SL BLDLK PS PT TT BETAM VREL MREL VABS MABS
 1 0.885 13.471 18.599 570.2 59.94 1495.1 1.337 776.6 0.694
 2 0.886 13.451 18.899 570.8 58.56 1472.0 1.319 796.8 0.714
 3 0.885 13.386 19.083 570.4 57.33 1451.2 1.303 812.6 0.730
 4 0.882 13.243 19.377 569.3 54.91 1409.2 1.272 839.6 0.758
 5 0.876 13.089 19.574 568.3 52.49 1364.0 1.236 861.1 0.780
 6 0.864 12.961 19.726 567.7 49.90 1313.0 1.193 878.2 0.798
 7 0.845 12.829 19.737 566.6 47.23 1256.4 1.145 887.8 0.809
 8 0.825 12.627 19.751 566.0 43.75 1197.2 1.094 903.2 0.825
 9 0.803 12.463 19.693 565.0 39.74 1129.7 1.035 912.0 0.835
 10 0.775 12.398 19.639 564.3 34.60 1046.6 0.959 913.7 0.838
 11 0.748 12.354 19.241 561.0 28.17 944.9 0.867 895.2 0.821
 12 0.700 12.296 18.696 556.6 24.36 882.8 0.810 868.6 0.797
 13 0.653 12.463 17.850 549.5 19.44 780.9 0.715 802.5 0.735

STA 13 000 MASS AVERAGED PROPERTIES
 PT= 19.412 TT= 565.94 GAMMA=1.4016 PT-RAT= 1.321 TT-RAT= 1.091
 RCU= 1605.3 VM= 830.4 CZ= 812.6 MM=0.755 MABS=0.792 MREL=1.114

ROTOR 1 STA= 13.500
 WTF= 61.365 I=12 MTIP=144 AFLOW= 150.80 D+C=0.0 ABH=0.0
 PSIC Z R OPTX=TT PHI OPTY=PT CURV VM INBR=3 CU ALPHAM MM
 0. -7.148 8.500 0. 0. 701.6 243.5 19.14 0.619
 0.050 -7.138 8.319 -0.76 -0.0142 730.7 260.7 19.63 0.646
 0.100 -7.132 8.142 -0.79 -0.0052 749.1 270.5 19.86 0.663
 0.200 -7.128 7.788 0.29 0.0162 778.0 280.2 19.81 0.692
 0.300 -7.129 7.428 2.02 0.0227 802.5 289.2 19.82 0.717
 0.400 -7.130 7.054 4.08 0.0431 820.1 297.8 19.96 0.735
 0.500 -7.133 6.653 6.40 0.0319 833.1 307.6 20.26 0.750
 0.600 -7.138 6.215 8.99 0.0207 847.9 324.8 20.96 0.766
 0.700 -7.125 5.731 12.00 0.0193 856.8 344.6 21.91 0.777
 0.800 -7.081 5.179 15.88 -0.0015 857.8 375.4 23.63 0.780
 0.900 -7.043 4.501 21.16 -0.0143 838.1 416.0 26.40 0.764
 0.950 -7.051 4.062 25.40 -0.0281 814.3 415.0 27.01 0.743
 1.000 -7.092 3.450 31.86 -0.0937 762.8 402.8 27.84 0.697

IN ROTOR
 VABS MABS
 1 0.877 14.512 19.371 579.6 60.82 1439.1 1.270 742.7 0.656
 2 0.879 14.551 19.934 582.5 58.82 1411.3 1.247 775.8 0.686
 3 0.880 14.575 20.312 583.5 57.29 1386.1 1.227 796.4 0.705
 4 0.878 14.507 20.785 582.9 54.58 1342.6 1.194 827.0 0.735
 5 0.871 14.351 21.082 581.9 51.85 1299.1 1.160 853.0 0.762
 6 0.857 14.156 21.213 580.5 49.11 1252.7 1.123 872.5 0.782
 7 0.837 13.915 21.204 578.9 46.12 1202.0 1.082 888.1 0.799
 8 0.816 13.635 21.218 578.1 42.32 1146.6 1.036 908.0 0.820
 9 0.793 13.348 21.137 576.8 37.89 1085.7 0.984 923.5 0.837
 10 0.766 13.109 21.063 575.9 32.12 1012.9 0.921 936.4 0.851
 11 0.737 12.925 20.793 573.8 24.29 919.5 0.838 935.7 0.852
 12 0.699 12.712 20.072 568.3 20.33 868.4 0.793 914.0 0.834
 13 0.649 12.589 18.981 559.6 15.11 790.1 0.722 862.5 0.788

STA 13.500 MASS AVERAGED PROPERTIES
 PT= 20.807 TT= 578.32 GAMMA=1.4015 PT-RAT= 1.416 TT-RAT= 1.115
 RCU= 2026.3 VM= 812.5 CZ= 794.5 MM=0.731 MABS=0.788 MREL=1.057

ROTOR 1
 WTR= 61.365 I=13 STA= 14.000
 PSIC Z OPTX=TT R PHI OPTV=PT AFLOW= 147.45 D=C=O. D*H=O.
 0. -6.945 8.500 0. 0. 0. 661.1 289.2 23.62 0.576
 0.050 -6.925 8.317 -0.60 -0.0117 695.9 307.4 23.83 0.607
 0.100 -6.910 8.139 -0.65 -0.0165 724.5 323.3 24.05 0.634
 0.200 -6.890 7.789 0.21 -0.0044 759.9 337.0 23.92 0.668
 0.300 -6.875 7.436 1.78 0.0097 785.7 348.8 23.94 0.694
 0.400 -6.863 7.071 3.68 0.0088 799.8 360.6 24.27 0.709
 0.500 -6.854 6.683 5.92 0.0270 808.1 372.4 24.74 0.718
 0.600 -6.847 6.260 8.58 0.0281 824.9 389.9 25.30 0.737
 0.700 -6.825 5.794 11.74 0.0100 835.9 409.5 26.10 0.750
 0.800 -6.777 5.266 15.94 -0.0045 843.5 444.1 27.77 0.760
 0.900 -6.742 4.619 21.61 -0.0344 835.4 490.9 30.44 0.756
 0.950 -6.756 4.204 26.15 -0.0524 818.8 494.8 31.15 0.744
 1.000 -6.809 3.632 33.48 -0.0749 788.5 490.3 31.88 0.720

IN ROTOR
 ABC=O. ABH=O.
 CU ALPHAM MM
 289.2 23.62 0.576
 307.4 23.83 0.607
 323.3 24.05 0.634
 337.0 23.92 0.668
 348.8 23.94 0.694
 360.6 24.27 0.709
 372.4 24.74 0.718
 389.9 25.30 0.737
 409.5 26.10 0.750
 444.1 27.77 0.760
 490.9 30.44 0.756
 494.8 31.15 0.744
 490.3 31.88 0.720

SL BLDLCK PS PT TT BETAM VREL MREL VABS MABS
 1 0.873 15.576 20.333 591.0 61.37 1379.6 1.202 721.6 0.629
 2 0.876 15.601 20.975 593.9 59.05 1353.0 1.181 760.8 0.664
 3 0.877 15.612 21.541 596.1 56.94 1328.0 1.161 793.4 0.694
 4 0.874 15.559 22.193 595.9 53.78 1286.0 1.130 831.2 0.731
 5 0.866 15.432 22.608 595.0 50.80 1243.2 1.098 859.6 0.759
 6 0.852 15.308 22.827 593.7 47.97 1194.6 1.058 877.3 0.777
 7 0.833 15.109 22.836 591.9 44.96 1142.0 1.015 889.8 0.791
 8 0.813 14.731 22.800 590.5 40.91 1091.5 0.975 912.4 0.815
 9 0.792 14.328 22.642 588.5 36.25 1036.5 0.930 930.9 0.835
 10 0.768 13.926 22.559 587.5 29.90 973.1 0.877 953.3 0.859
 11 0.737 13.490 22.274 585.4 21.21 896.1 0.811 969.0 0.877
 12 0.714 13.136 21.506 579.9 16.78 855.2 0.777 956.7 0.869
 13 0.662 12.705 20.328 571.1 10.81 802.8 0.733 928.6 0.847

STA 14.000 MASS AVERAGED PROPERTIES
 PT= 22.266 TT= 590.66 GAMMA=1.4014 PT-RAT= 1.515 TT-RAT= 1.139
 RCU= 2446.1 VM= 794.7 CZ= 776.3 MM=0.708 MABS=0.788 MREL=1.003

ROTOR1 STA= 14.500
 WTF= 61.365 I=14
 PSIC Z R
 O. -6.741 8.500
 O 050 -6.712 8.315
 O 100 -6.688 8.137
 O 200 -6.651 7.790
 O 300 -6.622 7.444
 O 400 -6.596 7.088
 O 500 -6.574 6.711
 O 600 -6.556 6.303
 O 700 -6.525 5.856
 O 800 -6.473 5.353
 O 900 -6.441 4.740
 O 950 -6.461 4.352
 1.000 -6.526 3.824

STA= 14.500
 MIIP=170
 OPTV=PT
 PHI
 C.
 0.
 -0.41
 -0.40
 0.31
 1.69
 3.50
 5.67
 8.31
 11.67
 16.17
 22.56
 27.47
 34.87

AFLOW= 145.80
 ITYPE=5
 CURV
 0.
 -0.0198
 -0.0238
 -0.0116
 0.0033
 0.0158
 0.0040
 0.0040
 -0.0019
 -0.0208
 -0.0678
 -0.0874
 -0.0668

VM
 616.6
 656.5
 686.2
 729.3
 754.9
 770.6
 778.9
 790.5
 799.1
 808.6
 817.0
 810.1
 799.2

CU
 355.6
 372.6
 385.8
 401.6
 412.0
 423.1
 435.7
 454.2
 473.2
 506.2
 561.6
 580.4
 588.4

IN ROTOR
 D-C-O.
 ABC-O.
 AL PHAM
 MM
 29.97
 29.58
 29.34
 28.84
 28.63
 28.77
 29.22
 29.88
 30.63
 32.05
 34.50
 35.62
 36.37

D-H-O.
 ARH-O.
 0.529
 0.565
 0.592
 0.632
 0.658
 0.675
 0.685
 0.698
 0.709
 0.721
 0.734
 0.731
 0.727

SL BLDLCK PS PT TT
 1 0.874 16.935 21.783 607.6
 2 0.877 16.936 22.483 609.8
 3 0.878 16.932 23.053 611.0
 4 0.875 16.868 23.871 610.7
 5 0.869 16.740 24.307 608.9
 6 0.857 16.570 24.524 606.9
 7 0.840 16.336 24.527 604.7
 8 0.824 15.969 24.463 602.9
 9 0.808 15.508 24.220 600.2
 10 0.790 14.965 24.032 598.4
 11 0.759 14.227 23.828 597.0
 12 0.750 13.725 23.210 593.0
 13 0.699 12.987 22.032 584.9

BETAM
 61.68
 59.05
 56.84
 53.15
 50.06
 47.05
 43.86
 39.78
 35.03
 28.47
 18.60
 13.04
 6.17

VREL
 1299.9
 1276.5
 1254.4
 1216.0
 1175.9
 1130.9
 1080.3
 1028.6
 975.9
 919.9
 862.0
 831.5
 803.8

MREL
 1.115
 1.098
 1.082
 1.054
 1.025
 0.990
 0.949
 0.908
 0.866
 0.820
 0.774
 0.751
 0.731

VABS
 711.9
 754.9
 787.2
 832.5
 860.0
 879.1
 892.5
 911.7
 928.7
 954.0
 991.4
 996.6
 992.4

MABS
 0.611
 0.649
 0.679
 0.722
 0.750
 0.770
 0.784
 0.805
 0.824
 0.851
 0.891
 0.900
 0.902

20

STA 14.500 MASS AVERAGED PROPERTIES
 PT= 23.883 TT= 603.82 GAMMA=1.4012 PT-RAT= 1.625 TT-RAT= 1.164
 RCU= 2894.4 VM= 764.6 CZ= 745.6 MM=0.673 MABS=0.783 MREL=0.939

| STA= 15.000 | | | | | | IN ROTOR | | | | | | | |
|-------------|--------|---------|---------------|---------|--------|----------|-------|-------|--|--|--|--|--|
| WTF= G1 365 | | I=15 | AFLOW= 145 75 | | D+C=O. | D+H=O. | | | | | | | |
| PSIC Z R | | OPTH=PT | CURV | VM | CU | ALPHAM | MM | | | | | | |
| PHT | | | | | | | | | | | | | |
| 0. | -6.538 | 8.500 | 0. | 0. | 569.6 | 451.1 | 38.37 | 0.479 | | | | | |
| 0.050 | -6.499 | 8.314 | -0.35 | 0.0088 | 614.2 | 460.4 | 35.85 | 0.519 | | | | | |
| 0.100 | -6.466 | 8.136 | -0.33 | 0.0128 | 645.6 | 464.6 | 35.74 | 0.548 | | | | | |
| 0.200 | -6.412 | 7.791 | 0.37 | 0.0028 | 692.7 | 469.3 | 34.12 | 0.593 | | | | | |
| 0.300 | -6.368 | 7.451 | 1.68 | -0.0011 | 719.3 | 475.2 | 33.45 | 0.619 | | | | | |
| 0.400 | -6.329 | 7.104 | 3.42 | -0.0053 | 731.1 | 483.1 | 33.46 | 0.632 | | | | | |
| 0.500 | -6.295 | 6.738 | 5.66 | -0.0031 | 738.3 | 496.6 | 33.93 | 0.641 | | | | | |
| 0.600 | -6.265 | 6.345 | 8.38 | -0.0120 | 746.4 | 512.9 | 34.50 | 0.651 | | | | | |
| 0.700 | -6.235 | 5.918 | 11.90 | -0.0244 | 754.0 | 535.6 | 35.39 | 0.661 | | | | | |
| 0.800 | -6.168 | 5.442 | 16.69 | -0.0364 | 763.2 | 570.5 | 36.78 | 0.673 | | | | | |
| 0.900 | -6.139 | 4.869 | 23.83 | -0.0666 | 788.5 | 635.5 | 38.87 | 0.702 | | | | | |
| 0.950 | -6.166 | 4.511 | 28.90 | -0.0607 | 800.3 | 670.2 | 39.94 | 0.718 | | | | | |
| 1.000 | -6.243 | 4.026 | 36.12 | -0.0570 | 807.1 | 710.3 | 41.35 | 0.731 | | | | | |

| STA = 15.000 MASS AVERAGED PROPERTIES | | | | | | | | | | TT-RAT= 1.191 | |
|---------------------------------------|-------|--------|--------|-------|-------|--------|-------|--------|-------|---------------|--|
| SL | | BDBLK | PS | PT | TT | BETAM | VREL | MREL | VABS | MABS | |
| 1 | 0.884 | 18.620 | 23.968 | 631.4 | 61.50 | 1193.6 | 1.004 | 726.6 | 0.611 | | |
| 2 | 0.887 | 18.548 | 24.616 | 631.2 | 58.61 | 1179.3 | 0.997 | 767.5 | 0.649 | | |
| 3 | 0.888 | 18.459 | 25.056 | 629.8 | 56.39 | 1166.1 | 0.990 | 795.3 | 0.675 | | |
| 4 | 0.886 | 18.270 | 25.716 | 626.2 | 52.59 | 1140.1 | 0.976 | 836.7 | 0.716 | | |
| 5 | 0.881 | 18.092 | 26.092 | 622.8 | 49.42 | 1105.7 | 0.952 | 862.1 | 0.742 | | |
| 6 | 0.873 | 17.925 | 26.238 | 619.6 | 46.51 | 1062.2 | 0.919 | 876.3 | 0.758 | | |
| 7 | 0.861 | 17.679 | 26.247 | 617.1 | 43.17 | 1012.2 | 0.879 | 889.8 | 0.773 | | |
| 8 | 0.850 | 17.270 | 26.080 | 614.4 | 39.11 | 962.0 | 0.839 | 905.7 | 0.790 | | |
| 9 | 0.839 | 16.784 | 25.875 | 611.9 | 34.01 | 909.6 | 0.798 | 924.9 | 0.811 | | |
| 10 | 0.827 | 16.161 | 25.673 | 610.0 | 27.06 | 857.1 | 0.756 | 952.8 | 0.840 | | |
| 11 | 0.803 | 15.111 | 25.616 | 609.7 | 15.85 | 819.6 | 0.730 | 1012.7 | 0.902 | | |
| 12 | 0.799 | 14.323 | 25.220 | 607.6 | 8.93 | 810.2 | 0.727 | 1043.9 | 0.936 | | |
| 13 | 0.751 | 13.270 | 24.388 | 602.8 | 0.01 | 807.1 | 0.731 | 1075.2 | 0.974 | | |

| STA 15.000 MASS AVERAGED PROPERTIES | | | | | PI-RA7= 1.748 | | TI-RAT= 1.191 | |
|-------------------------------------|--|------------|---------------|---------------|---------------|--|---------------|--|
| PT= 25.689 | | TT= 617.96 | GAMMA= 1.4010 | PI-RA7= 1.748 | | | | |
| PCUL= 2375.9 | | VM= 727.2 | CZ= 707.1 | MM= 0.633 | MABS= 0.7800 | | MRRL= 0.870 | |

ROTOR1
 WTF= 61.365 I=16 STA= 15.500
 PSIC Z OPTX=TT R MTIP=196 AFLOW= 146.77 D+C=0. D+H=0.
 PHI CURV ITYPE=5 INBR=3 CU ALPHAM MM
 0. 334 8.500 0. 531.8 512.5 43.94 0.442
 0.050 -6.286 8.312 -0.39 -0.0016 578.0 515.8 41.75 0.483
 0.100 -6.244 8.134 -0.36 -0.0084 611.6 518.3 40.28 0.514
 0.200 -6.173 7.793 0.42 -0.0102 660.3 520.0 38.22 0.560
 0.300 -6.114 7.459 1.80 -0.0165 688.2 524.5 37.32 0.587
 0.400 -6.062 7.120 3.65 -0.0253 700.2 532.7 37.26 0.600
 0.500 -6.015 6.767 5.99 -0.0372 703.4 546.5 37.84 0.605
 0.600 -5.974 6.389 8.88 -0.0479 707.2 565.4 38.64 0.611
 0.700 -5.925 5.982 12.54 -0.0479 712.5 590.7 39.66 0.619
 0.800 -5.864 5.536 17.45 -0.0478 724.8 629.8 40.99 0.633
 0.900 -5.838 5.006 24.67 -0.0226 764.0 695.1 42.29 0.675
 0.950 -5.871 4.677 29.77 -0.0289 787.1 740.3 43.24 0.702
 .000 -5.960 4.235 36.53 0.0158 823.3 799.9 44.18 0.744

SL BLDLTK PS PT TT BETAM VREL MREL VABS MABS
 1 0.904 19.719 25.440 646.7 61.70 1121.6 0.933 738.5 0.614
 2 0.906 19.625 26.024 644.7 58.71 1112.8 0.931 774.7 0.648
 3 0.906 19.536 26.481 642.6 56.30 1102.3 0.926 801.7 0.674
 4 0.905 19.359 27.158 637.8 52.33 1080.5 0.916 840.5 0.712
 5 0.903 19.179 27.552 633.7 49.00 1049.0 0.895 865.3 0.738
 6 0.899 19.011 27.730 630.2 45.95 1007.1 0.863 879.8 0.754
 7 0.893 18.794 27.738 627.4 42.64 956.2 0.823 890.8 0.767
 8 0.887 18.428 27.621 624.9 38.48 903.4 0.781 905.5 0.783
 9 0.882 17.939 27.457 622.6 33.13 850.8 0.739 925.5 0.804
 10 0.876 17.229 27.332 621.2 25.59 803.6 0.702 960.2 0.839
 11 0.862 15.900 27.285 621.0 13.85 786.9 0.696 1032.9 0.913
 12 0.855 14.927 27.095 620.5 6.17 791.7 0.706 1080.6 0.963
 13 0.808 13.414 26.567 618.3 -3.65 824.9 0.746 1147.9 1.038

STA 15.500 MASS AVERAGED PROPERTIES
 PT= 27.244 TT= 629.44 GAMMA=1.4008 PT-RAT= 1.854 TT-RAT= 1.214
 RCU= 3767.1 VM= 695.0 CZ= 674.1 MM=0.600 MABS=0.781 MREL=0.817

ROTOR1 STA= 16.000 AFLOW= 148.33 D+C=0. D*H=0. TE ROTOR
 WTP= 61.365 I=17 MTIP=209 ITYPE=6 INBR=3 ABC=0. ABH=0.
 PSIC Z R PHI CURV VM CU ALPHAM MM
 0. -6.131 8.500 0. 0. 501.0 557.9 48.07 0.413
 0.050 -6.072 8.311 -0.13 -0.0402 551.2 557.8 45.34 0.458
 0.100 -6.022 8.133 0.10 -0.0624 584.8 557.8 43.65 0.488
 0.200 -5.935 7.795 1.08 -0.0862 634.0 561.9 41.55 0.533
 0.300 -5.861 7.468 2.57 -0.0890 658.3 569.6 40.87 0.557
 0.400 -5.795 7.139 4.45 -0.0788 668.6 582.0 41.04 0.568
 0.500 -5.735 6.798 6.79 -0.0625 669.8 598.6 41.79 0.572
 0.600 -5.683 6.437 9.64 -0.0419 671.7 621.1 42.76 0.576
 0.700 -5.626 6.051 13.11 -0.0172 678.4 650.5 43.80 0.584
 0.800 -5.560 5.633 17.60 0.0315 694.7 690.3 44.82 0.602
 0.900 -5.537 5.144 24.00 0.0933 728.0 746.6 45.72 0.638
 0.950 -5.576 4.845 28.35 0.1749 761.7 792.0 46.12 0.674
 1.000 -5.677 4.442 35.49 0.0883 780.9 870.1 48.09 0.699

SL BLDLTK PS PT TT BETAM' VREL MREL VABS MABS
 1 0.926 20.517 26.560 658.0 62.00 1067.1 0.881 749.8 0.619
 2 0.927 20.399 27.120 654.9 58.76 1062.9 0.882 784.2 0.651
 3 0.927 20.322 27.560 652.0 56.32 1054.5 0.880 808.2 0.674
 4 0.927 20.232 28.390 647.4 52.08 1031.6 0.868 847.1 0.713
 5 0.928 20.173 28.940 643.7 48.66 996.6 0.844 870.5 0.737
 6 0.928 20.088 29.280 640.8 45.39 952.1 0.809 886.4 0.754
 7 0.928 19.910 29.380 638.3 41.90 899.9 0.768 898.3 0.767
 8 0.928 19.559 29.350 636.2 37.47 846.3 0.725 914.9 0.784
 9 0.928 19.025 29.280 634.4 31.60 796.5 0.686 939.9 0.809
 10 0.928 18.193 29.160 633.0 23.62 758.2 0.657 979.4 0.849
 11 0.930 16.832 28.920 631.6 12.49 745.6 0.654 1042.8 0.914
 12 0.914 15.685 28.770 631.5 4.73 764.3 0.676 1098.9 0.972
 13 0.875 14.309 28.650 632.3 -6.31 785.7 0.704 1169.2 1.047

STA 16.000 MASS AVERAGED PROPERTIES
 PT= 28.783 TT= 640.23 GAMMA=1.4006 P1-RAT= 1.959 TT-RAT= 1.234
 RCU= 4135.2 VM= 663.7 CZ= 644.1 MM=0.568 MABS=0.783 MREL=0.768

AVERAGE BLADE SPEED
 PCT IMM RAD IN OUT
 0. 8.500 1500.0 1500.0
 3.7 8.316 1468.6 1466.6
 7.3 8.137 1436.5 1435.3
 14.6 7.779 1369.9 1375.6
 21.9 7.416 1299.5 1317.9
 29.5 7.038 1224.4 1259.8
 37.6 6.637 1142.9 1199.6
 45.4 6.202 1053.2 1135.9
 56.1 5.724 952.3 1067.8
 67.0 5.184 835.4 994.1
 80.3 4.524 689.0 907.8
 88.8 4.104 593.3 855.0
 100.0 3.547 468.2 783.8

ACC PT ACC TT EFFICIENCY AXIAL
 RATIO RATIO AD. POLY VEL R
 1.8073 1.2686 0.686 0.711 0.600
 1.8454 1.2626 0.729 0.751 0.658
 1.8753 1.2570 0.766 0.786 0.697
 1.9318 1.2401 0.835 0.849 0.756
 1.9692 1.2410 0.887 0.897 0.789
 1.9924 1.2354 0.925 0.932 0.816
 1.9992 1.2306 0.950 0.955 0.843
 1.9971 1.2266 0.965 0.969 0.882
 1.9924 1.2231 0.977 0.979 0.941
 1.9842 1.2204 0.982 0.984 1.030
 1.9679 1.2177 0.981 0.983 1.182
 1.9577 1.2175 0.974 0.976 1.330
 1.9495 1.2190 0.960 0.964 1.348

FREE STA= 17.000
 MTIP=222 AFLOW= 146.21 D+C=O. FREE
 WTF= 61.365 I=18 OPTX=DPP PHI CURV VM CU ALPHAM MM
 PSIC Z R
 0 -5.700 8.500 0 0 498.6 557.9 48.21 0.411
 0.050 -5.639 8.314 0.83 -0.0377 551.5 557.6 45.32 0.458
 0.100 -5.587 8.140 1.56 -0.0551 587.3 557.4 43.50 0.490
 0.200 -5.500 7.811 2.94 -0.0627 642.9 560.7 41.10 0.541
 0.300 -5.430 7.495 4.34 -0.0540 673.1 567.5 40.14 0.570
 0.400 -5.375 7.178 5.87 -0.0389 690.3 578.8 39.98 0.588
 0.500 -5.333 6.850 7.70 -0.0156 697.0 594.1 40.44 0.596
 0.600 -5.305 6.503 9.96 0.0127 700.0 614.7 41.29 0.601
 0.700 -5.294 6.129 12.83 0.0453 704.8 642.3 42.34 0.608
 0.800 -5.302 5.713 16.72 0.0828 710.2 680.7 43.78 0.616
 0.900 -5.350 5.225 22.55 0.1554 725.5 735.1 45.37 0.635
 0.950 -5.405 4.934 26.21 0.2126 744.0 777.8 46.27 0.656
 1.000 -5.521 4.550 33.90 0.2101 732.4 849.4 49.23 0.650

SL BLDLTK PS PT TT BETAM VREL MREL VABS MABS
 1 0.940 20.520 26.533 658.0 62.11 1065.9 0.879 748.2 0.617
 2 0.940 20.378 27.093 654.9 58.77 1063.6 0.883 784.3 0.651
 3 0.940 20.278 27.532 652.0 56.25 1057.1 0.882 809.7 0.676
 4 0.940 20.132 28.390 647.4 51.83 1040.2 0.876 853.1 0.718
 5 0.940 19.997 28.940 643.7 48.28 1011.5 0.857 880.5 0.746
 6 0.940 19.828 29.280 640.8 44.89 974.4 0.830 900.9 0.767
 7 0.940 19.590 29.380 638.3 41.41 929.3 0.795 915.8 0.783
 8 0.940 19.249 29.350 636.2 37.28 879.8 0.756 931.7 0.800
 9 0.940 18.771 29.280 634.4 31.93 830.5 0.717 953.6 0.823
 10 0.940 18.111 29.160 633.0 24.76 782.0 0.679 983.7 0.853
 11 0.940 17.019 28.920 631.6 14.45 749.3 0.656 1032.8 0.904
 12 0.940 16.109 28.770 631.5 7.11 749.8 0.661 1076.4 0.949
 13 0.940 15.158 28.564 632.3 -3.64 733.9 0.652 1121.6 0.996

STA 17.000 MASS AVERAGED PROPERTIES
 PT= 28.777 TT= 640.23 GAMMA=1.4006 PT-RAT= 1.958 TT-RAT= 1.234
 RCU= 4135.2 VM= 675.8 CZ= 657.6 MM=0.579 MABS=0.788 MREL=0.782

STATOR STA= 18.000 LE STATOR
 WIF= 61.365 I=19 MTIP=235 AFLOW= 141.59 D+C=0. D+H=0.
 PSIC Z OPTX=OPP PHI CURV VM CU ALPHAM MM ABH=0.
 0 -5.250 8.500 0. 0. 538.2 557.9 46.03 0.445
 0.050 -5.192 8.323 1.45 -0.0105 581.3 557.0 43.78 0.484
 0.100 -5.143 8.157 2.47 -0.0165 612.4 556.2 42.25 0.512
 0.200 -5.064 7.839 3.97 -0.0199 665.2 558.7 40.03 0.561
 0.300 -5.004 7.532 5.20 -0.0164 697.0 564.8 39.02 0.592
 0.400 -4.963 7.223 6.47 -0.0121 717.5 575.2 38.72 0.613
 0.500 -4.938 6.905 7.98 -0.0086 728.2 589.4 38.98 0.625
 0.600 -4.933 6.568 9.89 -0.0057 735.0 608.7 39.63 0.633
 0.700 -4.952 6.204 12.40 -0.0018 742.7 634.4 40.50 0.643
 0.800 -5.003 5.800 15.88 0.0114 751.4 670.5 41.74 0.654
 0.900 -5.107 5.321 21.17 0.0299 762.0 721.8 43.45 0.669
 0.950 -5.201 5.029 24.68 0.0243 753.9 763.1 45.35 0.664
 1.000 -5.375 4.643 31.23 0.3271 803.7 832.3 46.00 0.718

STA 18.000 MASS AVERAGED PROPERTIES
 PT= 28.777 TT= 640.23 GAMMA=1.4007 PT-RAT= 1.958 TT-RAT= 1.234
 RCU= 4135.2 VM= 707.1 CZ= 689.5 MM=0.607 MABS=0.806 MREL=0.811

| STATOR | | | | | | | | | | IN STATOR | | | | | | | | | |
|-------------|-------|--------|--------|-------|-------|--------|-------|--------|-------|-----------|-------|-------|-------|--|--|--|--|--|--|
| STA= 19.000 | | | | | | | | | | D+H=0. | | | | | | | | | |
| WTF= 61.365 | | | | | | | | | | ABH=0. | | | | | | | | | |
| PSIC | | | | | | | | | | MM | | | | | | | | | |
| I=20 | | | | | | | | | | D+C=0. | | | | | | | | | |
| OPTX=0PP | | | | | | | | | | ABC=0. | | | | | | | | | |
| Z | | | | | | | | | | ALPHAM | | | | | | | | | |
| R | | | | | | | | | | CU | | | | | | | | | |
| PHI | | | | | | | | | | VM | | | | | | | | | |
| OPIY=BEIM | | | | | | | | | | INBR=4 | | | | | | | | | |
| AFLOW= | | | | | | | | | | 126 06 | | | | | | | | | |
| ITYPE=2 | | | | | | | | | | CURV | | | | | | | | | |
| O. | | | | | | | | | | 0. | | | | | | | | | |
| 1 | 0.875 | 21.005 | 26.533 | 658.0 | 61.59 | 1281.8 | 1.054 | 714.6 | 0.588 | 372.5 | 31.42 | 0.501 | | | | | | | |
| 2 | 0.877 | 20.977 | 27.093 | 654.9 | 59.58 | 1262.8 | 1.044 | 744.8 | 0.616 | 609.8 | 382.0 | 30.86 | 0.529 | | | | | | |
| 3 | 0.878 | 20.919 | 27.532 | 652.0 | 57.81 | 1245.4 | 1.035 | 769.0 | 0.639 | 639.4 | 388.9 | 30.38 | 0.551 | | | | | | |
| 4 | 0.879 | 20.753 | 28.390 | 647.4 | 54.24 | 1213.3 | 1.017 | 816.2 | 0.684 | 663.4 | 388.9 | 29.69 | 0.594 | | | | | | |
| 5 | 0.880 | 20.553 | 28.940 | 643.7 | 51.21 | 1181.6 | 0.998 | 848.8 | 0.717 | 709.0 | 404.3 | 29.29 | 0.625 | | | | | | |
| 6 | 0.881 | 20.332 | 29.280 | 640.8 | 48.38 | 1148.1 | 0.974 | 872.9 | 0.741 | 740.3 | 415.2 | 29.13 | 0.647 | | | | | | |
| 7 | 0.880 | 20.083 | 29.380 | 638.3 | 43.71 | 1110.8 | 0.947 | 888.8 | 0.758 | 762.5 | 425.0 | 29.22 | 0.661 | | | | | | |
| 8 | 0.880 | 19.772 | 29.350 | 636.2 | 42.77 | 1071.0 | 0.916 | 903.3 | 0.773 | 775.7 | 433.9 | 29.22 | 0.661 | | | | | | |
| 9 | 0.878 | 19.327 | 29.280 | 634.4 | 39.07 | 1029.7 | 0.885 | 923.6 | 0.794 | 786.2 | 444.8 | 29.50 | 0.673 | | | | | | |
| 10 | 0.875 | 18.663 | 29.160 | 633.0 | 34.12 | 988.8 | 0.854 | 954.2 | 0.824 | 799.5 | 462.5 | 30.05 | 0.687 | | | | | | |
| 11 | 0.867 | 17.625 | 28.920 | 631.6 | 27.36 | 955.0 | 0.832 | 1000.6 | 0.871 | 818.5 | 490.5 | 30.93 | 0.707 | | | | | | |
| 12 | 0.857 | 16.854 | 28.770 | 631.5 | 22.86 | 947.9 | 0.830 | 1036.8 | 0.908 | 848.1 | 531.0 | 32.05 | 0.739 | | | | | | |
| 13 | 0.837 | 15.847 | 28.564 | 632.3 | 17.22 | 948.3 | 0.837 | 1084.9 | 0.957 | 873.4 | 558.8 | 32.61 | 0.765 | | | | | | |
| | | | | | | | | | | 905.8 | 597.2 | 33.40 | 0.799 | | | | | | |

STA 19.000 MASS AVERAGED PROPERTIES
PT= 28.777 TT= 640.23 GAMMA=1.4005 PT-RAT= 1.958 TT-RAT= 1.234
RCU= 3037.7 VM= 766.1 CZ= 749.6 MM=0.653 MABS=0.757 MREL=0.940

STATOR STA = 20.000
 WTL= 61.365 I=21 MT/P=261 AFLOW= 118.87 D+C=0. D*H=0.
 PSIC Z R OPTX=DPP PHI CURV ITYPE=2 INBR=4 ABC=0. ABH=0.
 0 -4.300 8.500 0.0 0.0046 679.3 260.2 21.82 0.534
 1 -4.277 8.341 0.63 0.0092 701.6 276.2 21.49 0.582
 2 -4.258 8.188 1.26 0.0167 742.6 288.6 21.24 0.621
 3 -4.225 7.890 2.55 0.0211 769.3 295.8 21.03 0.648
 4 -4.201 7.598 3.89 0.0248 787.9 300.9 20.90 0.666
 5 -4.184 7.306 5.34 0.0309 798.5 304.3 20.86 0.678
 6 -4.174 7.007 6.96 0.0408 807.0 308.6 20.93 0.687
 7 -4.173 6.696 8.85 0.0540 818.7 316.7 21.15 0.699
 8 -4.180 6.368 11.08 0.0747 836.4 331.0 21.59 0.717
 9 -4.199 6.018 13.82 0.0874 860.2 351.1 22.20 0.741
 10 -4.232 5.632 17.32 0.1000 876.8 363.5 22.52 0.758
 11 -4.260 5.420 19.55 0.1259 897.8 379.5 22.91 0.778
 12 -4.300 5.188 22.50 0.1259 897.8 379.5 22.91 0.778

SL BLDLTK PS PT T1 RETAM VREL MREL VABS MABS
 1 0.849 21.212 26.533 658.0 62.34 1399.7 1.149 699.9 0.575
 2 0.851 21.184 27.093 654.9 60.53 1381.1 1.140 730.9 0.603
 3 0.852 21.152 27.532 652.0 59.02 1363.1 1.131 754.0 0.625
 4 0.855 21.075 28.390 647.4 56.07 1330.3 1.113 796.8 0.667
 5 0.857 20.978 28.940 643.7 53.64 1297.7 1.092 824.2 0.694
 6 0.859 20.856 29.280 640.8 51.44 1264.0 1.069 843.4 0.713
 7 0.860 20.700 29.380 638.3 49.42 1227.5 1.042 854.5 0.725
 8 0.860 20.484 29.350 636.2 47.25 1189.0 1.012 864.0 0.735
 9 0.858 20.164 29.280 634.4 44.59 1149.7 0.982 877.8 0.750
 10 0.855 19.671 29.160 633.0 41.15 1110.8 0.952 899.5 0.771
 11 0.847 18.953 28.920 631.6 36.77 1073.8 0.926 929.0 0.801
 12 0.840 18.485 28.770 631.5 34.07 1058.5 0.915 949.1 0.820
 13 0.828 17.897 28.564 632.3 30.84 1045.6 0.907 974.7 0.845

STA 20.000 MASS AVERAGED PROPERTIES
 P1= 28.777 TT= 640.23 GAMMA=1.4004 PT-RAT= 1.958 TT-RAT= 1.234
 RCU= 2126.4 VM= 789.7 CZ= 776.4 MM=0.670 MABS=0.719 MREL=1.035

STA 21.000 MASS AVERAGED PROPERTIES
PT= 28.776 TT= 640.23 GAMMA=1.4003 PT-RAT= 1.958 TT-RAT= 1.234
RCU= 1341.2 VM= 803.0 CZ= 792.9 MM=0.679 MABS=0.698 MREL=1.119

STATOR
 WTF= 61.365 I=23 STA= 22.000 AFLOW= 114.73 IN STATOR
 PSIC Z OPTX=OPP PHI CURV VM CU ALPHAM MM
 0 -3.204 8.500 0. 0. 656.8 82.8 7.19 0.537
 0.050 -3.211 8.351 0.54 -0.0034 588.4 85.5 7.08 0.566
 0.100 -3.218 8.207 1.04 -0.0020 711.2 87.0 6.97 0.588
 0.200 -3.232 7.928 1.99 0.0061 753.5 89.8 6.79 0.628
 0.300 -3.245 7.655 2.99 0.0149 780.2 91.1 6.66 0.654
 0.400 -3.259 7.382 4.09 0.0236 798.7 91.8 6.56 0.672
 0.500 -3.272 7.104 5.31 0.0320 808.9 91.9 6.48 0.683
 0.600 -3.286 6.817 6.69 0.0420 816.2 92.0 6.43 0.691
 0.700 -3.301 6.519 8.29 0.0540 825.2 92.9 6.43 0.701
 0.800 -3.316 6.205 10.32 0.0572 835.3 95.3 6.51 0.711
 0.900 -3.333 5.871 12.71 0.0638 842.8 98.3 6.65 0.719
 0.950 -3.341 5.696 13.98 0.0821 848.2 99.9 6.72 0.724
 1.000 -3.350 5.512 15.23 0.1249 857.7 101.8 6.77 0.733

SL BLDBLK PS PT TT BETAM VREL MREL VABS MABS
 1 0.880 21.735 26.533 658.0 65.14 1561.9 1.278 662.0 0.542
 2 0.880 21.725 27.093 654.9 63.63 1549.6 1.275 693.7 0.571
 3 0.881 21.718 27.532 652.0 62.41 1536.0 1.269 716.6 0.592
 4 0.882 21.690 28.390 647.4 60.08 1510.6 1.259 758.9 0.632
 5 0.883 21.633 28.940 643.7 58.23 1481.9 1.242 785.5 0.658
 6 0.883 21.542 29.280 640.8 56.59 1450.6 1.221 804.0 0.677
 7 0.884 21.412 29.380 638.3 55.15 1415.7 1.196 814.1 0.688
 8 0.885 21.240 29.350 636.2 53.70 1378.7 1.168 821.4 0.696
 9 0.886 21.011 29.280 634.4 52.03 1341.3 1.139 830.4 0.705
 10 0.886 20.727 29.160 633.0 50.12 1302.7 1.109 840.7 0.716
 11 0.886 20.403 28.920 631.6 48.06 1260.9 1.076 848.5 0.724
 12 0.887 20.199 28.770 631.5 46.86 1240.5 1.059 854.0 0.729
 13 0.887 19.894 28.564 632.3 45.44 1222.4 1.044 863.7 0.738

STA 22.000 MASS AVERAGED PROPERTIES
 PT= 28.776 TT= 640.23 GAMMA=1.4002 PT-RAT= 1.958 TT-RAT= 1.234
 RCU= 649.0 VM= 793.0 CZ= 786.0 MM=0.668 MABS=0.673 MREL=1.184

| STATOR | | STA= 23.000 | | | | | | | | | | TE STATOR | | | |
|-------------|--------|-------------|--------|----------|-------|---------------|-------|---------|-------|--------|-------|-----------|-------|-------|-------|
| WTF= 61.365 | | I=24 | | MTIP=300 | | AFLOW= 118.18 | | D+C=0. | | D+H=0. | | ABH=0. | | | |
| PSIC | | OPTX=DPP | | PHI | | OP1Y=BE1M | | ITYPE=3 | | INBR=4 | | ABC=0. | | | |
| | | Z | | R | | CURV | | VM | | CU | | ALPHAM | | MM | |
| 0. | -2.567 | 8.500 | 0. | 0. | 0. | 0. | 0. | 651.5 | 0. | 0. | 0. | 0. | 0. | 0.533 | 0. |
| 0.050 | -2.581 | 8.358 | 0.49 | 0.0062 | 678.4 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.557 | 0. |
| 0.100 | -2.595 | 8.219 | 0.91 | 0.0089 | 696.0 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.574 | 0. |
| 0.200 | -2.622 | 7.948 | 1.67 | 0.0121 | 738.2 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.614 | 0. |
| 0.300 | -2.648 | 7.684 | 2.43 | 0.0178 | 764.1 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.639 | 0. |
| 0.400 | -2.674 | 7.420 | 3.25 | 0.0261 | 782.7 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.657 | 0. |
| 0.500 | -2.700 | 7.152 | 4.17 | 0.0372 | 792.7 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.668 | 0. |
| 0.600 | -2.727 | 6.876 | 5.21 | 0.0498 | 798.8 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.675 | 0. |
| 0.700 | -2.756 | 6.589 | 6.42 | 0.0648 | 807.7 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.684 | 0. |
| 0.800 | -2.785 | 6.292 | 8.00 | 0.0932 | 827.7 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.703 | 0. |
| 0.900 | -2.816 | 5.977 | 9.87 | 0.1246 | 827.4 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.704 | 0. |
| 0.950 | -2.832 | 5.809 | 10.79 | 0.1318 | 827.3 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.704 | 0. |
| 1.000 | -2.850 | 5.631 | 11.52 | 0.1267 | 815.2 | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0. | 0.692 | 0. |
| SL | | BLDBLK | | PS | | PT | | TT | | BEYAM | | VREL | | MREL | |
| 1 | 0.940 | 21.526 | 26.109 | 658.0 | 66.52 | 1635.4 | 1.337 | 651.5 | 0.533 | 651.5 | 0.533 | 651.5 | 0.533 | 651.5 | 0.533 |
| 2 | 0.940 | 21.527 | 26.581 | 654.9 | 65.30 | 1623.4 | 1.334 | 678.4 | 0.557 | 678.4 | 0.557 | 678.4 | 0.557 | 678.4 | 0.557 |
| 3 | 0.940 | 21.523 | 26.910 | 652.0 | 64.36 | 1608.7 | 1.327 | 696.0 | 0.574 | 696.0 | 0.574 | 696.0 | 0.574 | 696.0 | 0.574 |
| 4 | 0.940 | 21.507 | 27.731 | 647.4 | 62.24 | 1585.0 | 1.318 | 738.2 | 0.614 | 738.2 | 0.614 | 738.2 | 0.614 | 738.2 | 0.614 |
| 5 | 0.940 | 21.478 | 28.269 | 643.7 | 60.60 | 1556.5 | 1.301 | 764.1 | 0.639 | 764.1 | 0.639 | 764.1 | 0.639 | 764.1 | 0.639 |
| 6 | 0.940 | 21.425 | 28.638 | 640.8 | 59.13 | 1525.5 | 1.281 | 782.7 | 0.657 | 782.7 | 0.657 | 782.7 | 0.657 | 782.7 | 0.657 |
| 7 | 0.940 | 21.337 | 28.780 | 638.3 | 57.87 | 1490.5 | 1.256 | 792.7 | 0.668 | 792.7 | 0.668 | 792.7 | 0.668 | 792.7 | 0.668 |
| 8 | 0.940 | 21.204 | 28.769 | 636.2 | 56.64 | 1452.8 | 1.227 | 798.8 | 0.675 | 798.8 | 0.675 | 798.8 | 0.675 | 798.8 | 0.675 |
| 9 | 0.940 | 21.019 | 28.749 | 634.4 | 55.22 | 1415.8 | 1.199 | 807.7 | 0.684 | 807.7 | 0.684 | 807.7 | 0.684 | 807.7 | 0.684 |
| 10 | 0.940 | 20.734 | 28.851 | 633.0 | 53.30 | 1384.9 | 1.177 | 827.7 | 0.703 | 827.7 | 0.703 | 827.7 | 0.703 | 827.7 | 0.703 |
| 11 | 0.940 | 20.293 | 28.252 | 631.6 | 51.89 | 1340.6 | 1.141 | 827.4 | 0.704 | 827.4 | 0.704 | 827.4 | 0.704 | 827.4 | 0.704 |
| 12 | 0.940 | 20.013 | 27.861 | 631.5 | 51.10 | 1317.3 | 1.121 | 827.3 | 0.704 | 827.3 | 0.704 | 827.3 | 0.704 | 827.3 | 0.704 |
| 13 | 0.940 | 19.713 | 27.159 | 632.3 | 50.64 | 1285.4 | 1.091 | 815.2 | 0.692 | 815.2 | 0.692 | 815.2 | 0.692 | 815.2 | 0.692 |

STA 23.000 MASS AVERAGED PROPERTIES

PT= 28.163 TT= 640.23 GAMMA=1.4002 PT-RAT= 1.916 TT-RAT= 1.234
 RCU= 0. VM= 777.4 CZ= 773.3 MM=0.654 MABS=0.654 MREL=1.244

| AVERAGE | | BLADE SPEED | | ACC PT | | ACC TT | | EFFICIENCY | | AXIAL | |
|-------------|-------|-------------|--|--------|--------|--------|-------|------------|-------|-------|-------|
| PCT IMM RAD | | IN OUT | | RATIO | | RATIO | | AD. | | POLY | |
| 0. | 8.500 | | | 1.7766 | 1.2686 | 0.665 | 0.691 | 1.210 | 1.210 | 0.691 | 1.210 |
| 4.7 | 8.340 | | | 1.8088 | 1.2626 | 0.703 | 0.727 | 1.167 | 1.167 | 0.727 | 1.167 |
| 9.3 | 8.188 | | | 1.8311 | 1.2570 | 0.734 | 0.756 | 1.137 | 1.137 | 0.756 | 1.137 |
| 18.0 | 7.893 | | | 1.8870 | 1.2481 | 0.802 | 0.819 | 1.112 | 1.112 | 0.819 | 1.112 |
| 26.5 | 7.608 | | | 1.9236 | 1.2410 | 0.853 | 0.866 | 1.100 | 1.100 | 0.866 | 1.100 |
| 35.0 | 7.322 | | | 1.9487 | 1.2354 | 0.893 | 0.902 | 1.096 | 1.096 | 0.902 | 1.096 |
| 43.8 | 7.028 | | | 1.9584 | 1.2306 | 0.919 | 0.926 | 1.096 | 1.096 | 0.926 | 1.096 |
| 52.9 | 6.722 | | | 1.9576 | 1.2266 | 0.935 | 0.941 | 1.099 | 1.099 | 0.941 | 1.099 |
| 62.5 | 6.397 | | | 1.9563 | 1.2231 | 0.948 | 0.953 | 1.106 | 1.106 | 0.953 | 1.106 |
| 73.0 | 6.046 | | | 1.9632 | 1.2204 | 0.965 | 0.968 | 1.134 | 1.134 | 0.968 | 1.134 |
| 84.8 | 5.649 | | | 1.9224 | 1.2177 | 0.944 | 0.949 | 1.147 | 1.147 | 0.949 | 1.147 |
| 91.6 | 5.419 | | | 1.8958 | 1.2175 | 0.923 | 0.929 | 1.186 | 1.186 | 0.929 | 1.186 |
| 100.0 | 5.137 | | | 1.8480 | 1.2190 | 0.876 | 0.887 | 1.162 | 1.162 | 0.887 | 1.162 |

EXIT STA= 24.000
 I=25
 WTF= 61.365 OPTX=DPP
 PSIC Z R
 0. -2.000 8.500
 0.050 -2.000 8.362
 0.100 -2.000 8.226
 0.200 -2.000 7.964
 0.300 -2.000 7.707
 0.400 -2.000 7.452
 0.500 -2.000 7.194
 0.600 -2.000 6.929
 0.700 -2.000 6.656
 0.800 -2.000 6.374
 0.900 -2.000 6.078
 0.950 -2.000 5.922
 1.000 -2.000 5.757

STA= 24.000
 MTIP=313
 OPTV=FREE
 PHI
 0. 0.0039
 0.32 0.0079
 0.63 0.0157
 1.18 0.0231
 1.67 0.0309
 2.15 0.0398
 2.63 0.0506
 3.12 0.0640
 3.62 0.0789
 4.11 0.0994
 4.59 0.1149
 5.28 0.1260

AFLOW= 116.57
 ITYPE=0
 CURV
 0. 668.7
 0.0039 695.2
 0.0079 712.5
 0.0157 754.5
 0.0231 781.5
 0.0309 801.4
 0.0398 812.9
 0.0506 820.4
 0.0640 830.7
 0.0789 850.3
 0.0994 846.8
 0.1149 844.5
 0.1260 831.2

FREE
 D+H=0.
 ABH=0.
 MM
 0. 0.548
 0. 0.572
 0. 0.589
 0. 0.628
 0. 0.655
 0. 0.675
 0. 0.687
 0. 0.695
 0. 0.705
 0. 0.725
 0. 0.722
 0. 0.720
 0. 0.707

SL BLDLCK PS PT TT
 1 0.950 21.297 26.109 658.0
 2 0.950 21.294 26.581 654.9
 3 0.950 21.286 26.910 652.0
 4 0.950 21.254 27.731 647.4
 5 0.950 21.197 28.269 643.7
 6 0.950 21.113 28.638 640.8
 7 0.950 20.995 28.780 638.3
 8 0.950 20.837 28.769 636.2
 9 0.950 20.624 28.749 634.4
 10 0.950 20.339 28.851 633.0
 11 0.950 19.959 28.252 631.6
 12 0.950 19.722 27.861 631.5
 13 0.950 19.453 27.159 632.3

BETAM
 65.97
 64.77
 63.86
 61.77
 60.12
 58.64
 57.37
 56.14
 54.73
 52.91
 51.71
 51.06
 50.71

VREL
 1642.3
 1631.1
 1617.1
 1595.1
 1568.6
 1540.1
 1507.5
 1472.5
 1438.6
 1410.0
 1366.6
 1343.6
 1312.6

MREL
 1.345
 1.342
 1.336
 1.328
 1.314
 1.296
 1.273
 1.247
 1.222
 1.202
 1.165
 1.146
 1.117

VABS
 668.7
 695.2
 712.5
 754.5
 781.5
 801.4
 812.9
 820.4
 830.7
 850.3
 846.8
 844.5
 831.2

MABS
 0.548
 0.572
 0.589
 0.628
 0.655
 0.675
 0.687
 0.695
 0.705
 0.725
 0.722
 0.720
 0.707

STA 24.000 MASS AVERAGED PROPERTIES
 PT= 28 163 TT= 640.23 GAMMA=1.4002 PT-RAT= 1.916 TT-RAT= 1.234
 RCU= 0. VM= 796.6 CZ= 795.5 MM=0.671 MABS=0.671 MREL=1.262

FX1T STA= 25.000 AFLOW= 116 27 D+C=O. FRFE
 MTIP=326 OPTY=FREE ITYPE=O INBR=O ABC=O. D+H=O.
 WTF= 61.365 I=26 OPTX=DPP PHI CURV VM CU ALPHAM ARH=O.
 PSIC Z R
 0 -1.270 8.500 0. 0. 0.0025 711.4 0. 0. 0.562
 0.050 -1.270 8.365 0.19 0. 0.0048 728.0 0. 0. 0.586
 0.100 -1.270 8.232 0.36 0. 0.0091 768.2 0. 0. 0.602
 0.200 -1.270 7.975 0.66 0. 0.0135 793.2 0. 0. 0.641
 0.300 -1.270 7.723 0.91 0. 0.0179 810.9 0. 0. 0.665
 0.400 -1.270 7.472 1.13 0. 0.0227 819.5 0. 0. 0.683
 0.500 -1.270 7.218 1.32 0. 0.0279 823.0 0. 0. 0.693
 0.600 -1.270 6.956 1.48 0. 0.0334 827.8 0. 0. 0.697
 0.700 -1.270 6.686 1.58 0. 0.0397 839.6 0. 0. 0.703
 0.800 -1.270 6.407 1.62 0. 0.0463 824.5 0. 0. 0.715
 0.900 -1.270 6.112 1.54 0. 0.0493 814.0 0. 0. 0.701
 0.950 -1.270 5.956 1.42 0. 0.1263 794.2 0. 0. 0.691
 1.000 -1.270 5.790 0.00 0. 0. 0. 0. 0. 0.673

SL BLDLTK PS PT TT RETAM VREL MREL VABS MABS
 1 0.956 21.067 26.109 658.0 65.43 1649.3 1.353 685.8 0.562
 2 0.956 21.065 26.581 654.9 64.27 1638.6 1.350 711.4 0.586
 3 0.956 21.060 26.910 652.0 63.38 1625.0 1.345 728.0 0.602
 4 0.956 21.040 27.731 647.4 61.37 1603.3 1.337 768.2 0.641
 5 0.956 21.005 28.269 643.7 59.80 1576.9 1.323 793.2 0.665
 6 0.956 20.954 28.638 640.8 58.41 1548.0 1.304 810.9 0.683
 7 0.956 20.884 28.780 638.3 57.24 1514.6 1.280 819.5 0.693
 8 0.956 20.792 28.769 636.2 56.16 1477.9 1.252 823.0 0.697
 9 0.956 20.674 28.749 634.4 54.95 1441.3 1.223 827.8 0.703
 10 0.956 20.526 28.851 633.0 53.40 1408.3 1.199 839.6 0.715
 11 0.956 20.342 28.252 631.6 52.61 1357.7 1.155 824.5 0.701
 12 0.956 20.235 27.861 631.5 52.25 1329.4 1.129 814.0 0.691
 13 0.956 20.052 27.159 632.3 52.15 1294.2 1.096 794.2 0.673

STA 25.000 MASS AVERAGED PROPERTIES
 PT= 28.163 TT= 640.23 GAMMA=1.4002 PT-RAT= 1.916 TT-RAT= 1.234
 RCU= 0. VM= 797.9 CZ= 797.7 MM=0.672 MABS=0.672 MREL=1.264

EXIT STA= 26 000 AFLOW= 116.28 D+C=O. FREE D+H=O.
 WTF= 61.365 MTIP=339 OPTV=FREE ITYPE=O INBR=O ABC=O. ABH=O.
 PSIC Z R PHI CURV VM CU ALPHAM MM
 0. -0.350 8.500 0. 0. 703.4 0. 0. 0. 0.578
 0.050 -0.350 8.367 0.11 -0.0000 728.1 0 0. 0. 0.601
 0.100 -0.350 8.237 0.21 -0.0000 743.9 0 0. 0. 0.617
 0.200 -0.350 7.982 0.38 -0.0000 781.9 0 0. 0. 0.653
 0.300 -0.350 7.733 0.49 -0.0000 804.2 0 0. 0. 0.675
 0.400 -0.350 7.484 0.57 -0.0000 818.5 0 0. 0. 0.690
 0.500 -0.350 7.231 0.62 -0.0000 822.9 0 0. 0. 0.696
 0.600 -0.350 6.970 0.61 -0.0000 821.1 0 0. 0. 0.695
 0.700 -0.350 6.700 0.55 -0.0000 819.1 0 0. 0. 0.699
 0.800 -0.350 6.419 0.40 -0.0000 822.5 0 0. 0. 0.675
 0.900 -0.350 6.121 0.12 -0.0000 796.0 0 0. 0. 0.659
 0.950 -0.350 5.961 -0.10 -0.0000 778.3 0 0. 0. 0.628
 1.000 -0.350 5.791 0. 0. 745.2 0 0. 0. 0.628

SL RDLBLK PS PT TT BETAM VREL MREL VABS MARS
 1 0.956 20.824 26.109 658.0 64.88 1656.7 1.361 703.4 0.578
 2 0.956 20.824 26.581 654.9 63.75 1646.3 1.359 728.1 0.601
 3 0.956 20.824 26.910 652.0 62.90 1632.8 1.353 743.9 0.617
 4 0.956 20.824 27.731 647.4 60.97 1611.1 1.346 781.9 0.653
 5 0.956 20.824 28.269 643.7 59.49 1584.0 1.330 804.2 0.675
 6 0.956 20.824 28.638 640.8 58.21 1553.8 1.310 818.5 0.690
 7 0.956 20.824 28.780 638.3 57.18 1518.4 1.284 822.9 0.696
 8 0.956 20.824 28.769 636.2 55.28 1478.9 1.252 821.1 0.695
 9 0.956 20.823 28.749 634.4 55.28 1438.4 1.220 819.1 0.695
 10 0.956 20.923 28.851 633.0 54.02 1399.9 1.189 822.5 0.699
 11 0.956 20.822 28.252 631.6 53.61 1341.8 1.137 796.0 0.675
 12 0.956 20.822 27.861 631.5 53.51 1308.6 1.107 778.3 0.659
 13 0.956 20.822 27.159 632.3 53.90 1264.7 1.066 745.2 0.623

SIA 26.000 MASS AVERAGED PROPERTIES
 PT= 28.163 TT= 640.23 GAMMA=1.4002 PT-RAT= 1.916 TT-RAT= 1.234
 RCU= 0. VM= 796.1 CZ= 796.0 MM=0.670 MABS=0.670 MREL=1.264

Phase III Potor

BLADE FORCES

THE FORCE CALCULATIONS ARE 'PER BLADE ROW'.
 TO FIND THE FORCE ON A SINGLE BLADE, DIVIDE BY 'NB'.
 THE FORCES ARE THAT OF THE AIR ON THE BLADES.
 POSITIVE AXIAL IS AFT; POSITIVE TANGENTIAL IS IN ROTATION DIRECTION.
 THE COLUMNS HEADED BY F-TAN*, F-AXL*, AND F-RAD* ARE THE TANGENTIAL,
 AXIAL, AND RADIAL FORCES PER INCH OF CHANGE IN R-AVG.

| SL | R-AVG (IN.) | H-AVG (IN.) | F-TAN* (LB/IN) | F-AXL* (LB/IN) | F-RAD* (LB/IN) |
|----|----------------|----------------|-------------------|-------------------|-------------------|
| 1 | 8.500 | 0.184 | -288.3 | -402.4 | -36.8 |
| 2 | 8.316 | 0.184 | -292.6 | -403.9 | -32.7 |
| 3 | 8.137 | 0.363 | -297.6 | -405.6 | -27.0 |
| 4 | 7.779 | 0.721 | -299.1 | -401.5 | -21.7 |
| 5 | 7.416 | 1.084 | -296.7 | -388.1 | -10.9 |
| 6 | 7.038 | 1.462 | -290.3 | -367.9 | -0.7 |
| 7 | 6.617 | 1.863 | -281.0 | -339.2 | -6.6 |
| 8 | 6.202 | 2.298 | -270.3 | -301.8 | -17.2 |
| 9 | 5.724 | 2.776 | -260.1 | -259.4 | -26.4 |
| 10 | 5.184 | 3.316 | -244.6 | -206.9 | -31.1 |
| 11 | 4.524 | 3.976 | -214.5 | -134.4 | -29.1 |
| 12 | 4.104 | 4.396 | -187.0 | -82.6 | -29.1 |
| 13 | 3.547 | 4.953 | -165.3 | -46.1 | -28.8 |

NET TORQUE= -7884.4 IN-LB
 NET TAN. FORCE= -1263.1 LB
 NET AXIAL FORCE= -1311.3 LB
 NET RADIAL FORCE= -109.2 LB

2. STREAMSURFACE BLADE COORDINATES

Figure 54 shows the stacked Phase III rotor streamsurface sections. Each page of the following tabulation gives the coordinates for one of these sections. The streamline designation for these sections corresponds to the calculation streamlines of the circumferential average flow calculation. Streamline 1 is at the casing and streamline 13 is at the hub. Also given in the tabulations are coordinates for the section meanline, the meanline angle, and the section thickness at each point. Streamsurface section chord, camber angle, and stagger angle are also given. All dimensions in this tabulation are in inches or degrees.

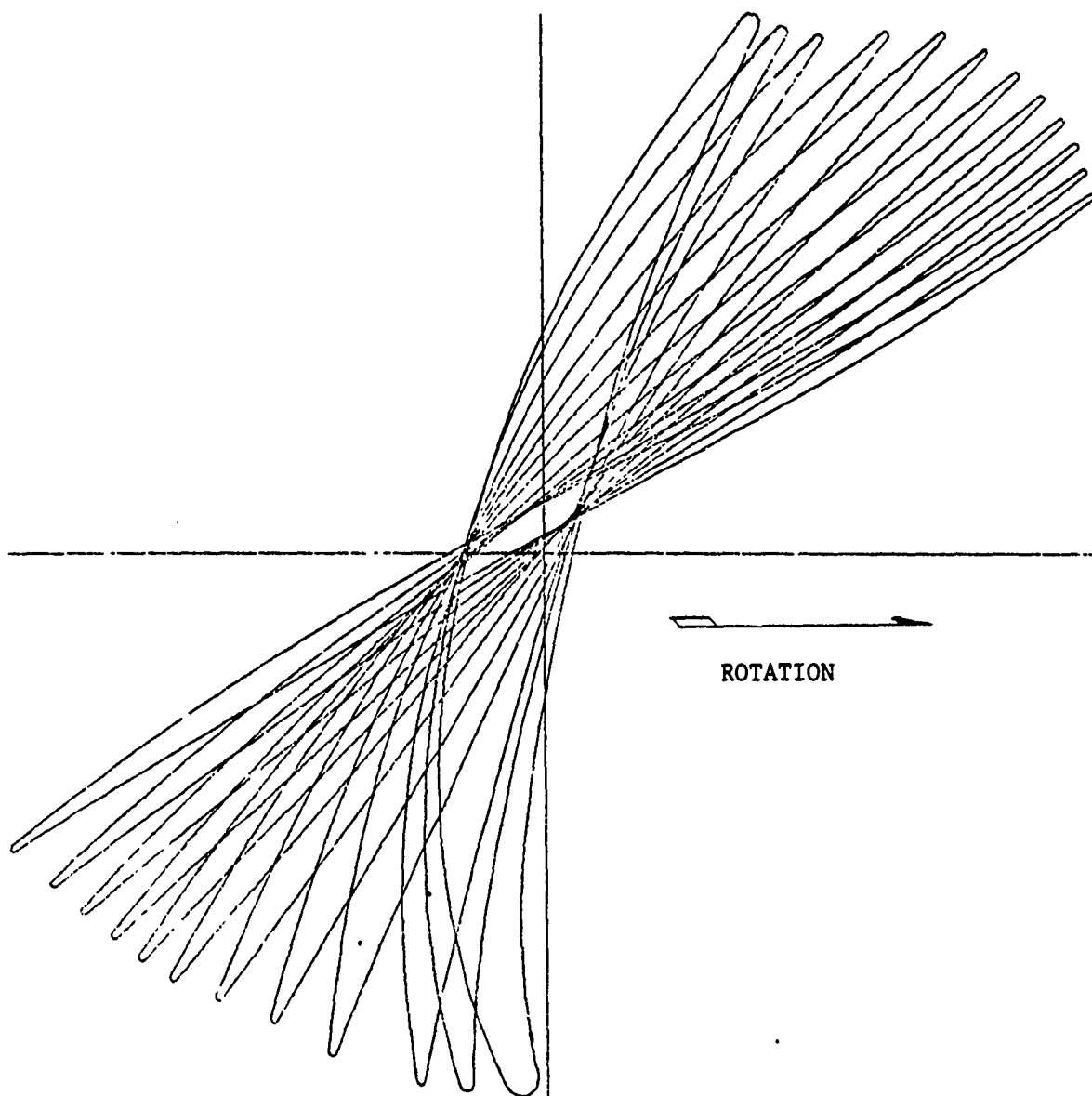


Figure 54. Stacked Phase III Rotor Streamsurface Sections

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 1

| PT | Z | R | THETA | B* | T(Z) | PHI | X | B'M | T(M) |
|----|----------|---------|----------|---------|---------|-----|----------|---------|---------|
| 1 | -1.11520 | 8.50000 | 0.21035 | -54.985 | 0.01884 | 0. | -1.11520 | -54.985 | 0.01884 |
| 2 | -1.06430 | 8.50000 | 0.20172 | -55.546 | 0.02331 | 0. | -1.06430 | -55.546 | 0.02331 |
| 3 | -0.96250 | 8.50000 | 0.18390 | -56.645 | 0.03219 | 0. | -0.96250 | -56.645 | 0.03219 |
| 4 | -0.86080 | 8.50000 | 0.16532 | -57.755 | 0.04090 | 0. | -0.86080 | -57.755 | 0.04090 |
| 5 | -0.75900 | 8.50000 | 0.14590 | -58.943 | 0.04930 | 0. | -0.75900 | -58.943 | 0.04930 |
| 6 | 0.64700 | 8.50000 | 0.12339 | 60.414 | 0.05808 | 0. | -0.64700 | 60.414 | 0.05808 |
| 7 | -0.52490 | 8.50000 | 0.09722 | -62.004 | 0.06692 | 0. | -0.52490 | -62.004 | 0.06692 |
| 8 | -0.40280 | 8.50000 | 0.06944 | -63.192 | 0.07484 | 0. | -0.40280 | -63.192 | 0.07484 |
| 9 | -0.28060 | 8.50000 | 0.04062 | -63.660 | 0.08168 | 0. | -0.28060 | -63.660 | 0.08168 |
| 10 | -0.15850 | 8.50000 | 0.01177 | -63.265 | 0.08732 | 0. | -0.15850 | -63.265 | 0.08732 |
| 11 | -0.03640 | 8.50000 | -0.01619 | -62.262 | 0.09163 | 0. | -0.03640 | -62.262 | 0.09163 |
| 12 | 0.08570 | 8.50000 | -0.04283 | -61.050 | 0.09454 | 0. | 0.08570 | -61.050 | 0.09454 |
| 13 | 0.20790 | 8.50000 | -0.06828 | -60.131 | 0.09600 | 0. | 0.20790 | -60.131 | 0.09600 |
| 14 | 0.33000 | 8.50000 | -0.09297 | -59.478 | 0.09529 | 0. | 0.33000 | -59.478 | 0.09529 |
| 15 | 0.45210 | 8.50000 | -0.11705 | -58.874 | 0.08866 | 0. | 0.45210 | -58.874 | 0.08866 |
| 16 | 0.57430 | 8.50000 | -0.14058 | -58.332 | 0.07609 | 0. | 0.57430 | -58.332 | 0.07609 |
| 17 | 0.69640 | 8.50000 | -0.16358 | -57.586 | 0.05867 | 0. | 0.69640 | -57.586 | 0.05867 |
| 18 | 0.81850 | 8.50000 | -0.18563 | -56.089 | 0.03796 | 0. | 0.81850 | -56.089 | 0.03796 |
| 19 | 0.92030 | 8.50000 | -0.20289 | -54.322 | 0.01923 | 0. | 0.92030 | -54.322 | 0.01923 |

MEANLINE INPUT DATA - STREAMLINE 3

| PT | Z | R | THETA | B* | T(Z) | PHI | X | B'M | T(M) |
|----|----------|---------|----------|---------|---------|--------|----------|---------|---------|
| 1 | -1.19130 | 8.14010 | 0.21626 | -53.628 | 0.01946 | 0.775 | -1.19136 | -53.626 | 0.01946 |
| 2 | -1.13570 | 8.14090 | 0.20690 | -54.205 | 0.02421 | 0.768 | 1.13575 | -54.202 | 0.02421 |
| 3 | -1.02470 | 8.14240 | 0.18759 | -55.324 | 0.03365 | 0.727 | -1.02474 | 55.322 | 0.03365 |
| 4 | -0.91370 | 8.14370 | 0.16748 | -56.417 | 0.04289 | 0.612 | 0.91373 | -56.415 | 0.04289 |
| 5 | -0.80270 | 8.14480 | 0.14652 | -57.498 | 0.05180 | 0.428 | -0.80273 | -57.497 | 0.05180 |
| 6 | -0.68050 | 8.14550 | 0.12243 | -58.678 | 0.06106 | 0.215 | -0.68053 | -58.677 | 0.06106 |
| 7 | -0.54730 | 8.14570 | 0.09490 | -59.850 | 0.07035 | -0.018 | 0.54733 | -59.850 | 0.07035 |
| 8 | -0.41410 | 8.14540 | 0.06621 | -60.678 | 0.07861 | 0.291 | -0.41413 | -60.678 | 0.07861 |
| 9 | -0.28080 | 8.14440 | 0.03700 | -60.631 | 0.08567 | -0.561 | -0.28082 | -60.630 | 0.08567 |
| 10 | -0.14760 | 8.14270 | 0.00854 | -59.418 | 0.09138 | -0.751 | -0.14761 | -59.416 | 0.09138 |
| 11 | -0.01440 | 8.14080 | -0.01826 | -57.769 | 0.09563 | -0.788 | -0.01440 | -57.766 | 0.09563 |
| 12 | 0.11890 | 8.13910 | -0.04349 | -56.335 | 0.09833 | -0.679 | 0.11891 | -56.333 | 0.09833 |
| 13 | 0.25210 | 8.13760 | -0.06759 | -55.371 | 0.09943 | 0.517 | 0.25212 | -55.369 | 0.09943 |
| 14 | 0.38530 | 8.13660 | -0.09102 | -54.746 | 0.09739 | -379 | 0.38532 | -54.745 | 0.09739 |
| 15 | 0.51860 | 8.13590 | -0.11395 | -54.187 | 0.08948 | -0.321 | 0.51862 | -54.187 | 0.08948 |
| 16 | 0.65180 | 8.13520 | -0.13639 | -53.547 | 0.07625 | -0.355 | 0.65183 | -53.546 | 0.07625 |
| 17 | 0.78500 | 8.13420 | -0.15823 | -52.679 | 0.05871 | 0.371 | 0.78503 | -52.678 | 0.05871 |
| 18 | 0.91830 | 8.13360 | -0.17927 | -51.445 | 0.03820 | -0.180 | 0.91833 | -51.445 | 0.03820 |
| 19 | 1.02930 | 8.13320 | 0.19603 | -50.196 | 0.01997 | 0.095 | 1.02933 | -50.196 | 0.01997 |

PHASE III ROTOR

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 4

| PT | Z | R | THETA | B* | T(Z) | PHI | X | B*M | T(M) |
|----|----------|---------|----------|---------|---------|-------|----------|---------|---------|
| 1 | -1.27080 | 7.76280 | 0.22306 | -52.318 | 0.02006 | 1.773 | 1.27111 | -52.305 | 0.02007 |
| 2 | -1.21110 | 7.76470 | 0.21302 | -52.825 | 0.02541 | 1.768 | -1.21138 | -52.812 | 0.02542 |
| 3 | -1.09170 | 7.76840 | 0.19239 | -53.807 | 0.03603 | 1.748 | -1.09192 | -53.794 | 0.03604 |
| 4 | -0.97240 | 7.77200 | 0.17102 | -54.758 | 0.04642 | 1.700 | 0.97257 | -54.746 | 0.04643 |
| 5 | -0.85310 | 7.77550 | 0.14890 | -55.734 | 0.05643 | 1.605 | -0.85322 | -55.724 | 0.05645 |
| 6 | -0.72180 | 7.77900 | 0.12357 | -56.927 | 0.06683 | 1.422 | -0.72187 | -56.919 | 0.06684 |
| 7 | -0.57860 | 7.78230 | 0.09464 | -58.029 | 0.07724 | 1.138 | -0.57864 | -58.024 | 0.07725 |
| 8 | -0.43520 | 7.78470 | 0.05491 | -58.295 | 0.08646 | 0.821 | -0.43532 | -58.293 | 0.08647 |
| 9 | -0.29210 | 7.78640 | 0.03553 | -57.363 | 0.09430 | 0.541 | -0.29211 | -57.362 | 0.09430 |
| 10 | -0.14890 | 7.78740 | 0.00787 | -55.272 | 0.10060 | 0.351 | -0.14890 | -55.272 | 0.10060 |
| 11 | -0.00570 | 7.78810 | -0.01766 | -53.334 | 0.10522 | 0.239 | -0.00570 | -53.334 | 0.10522 |
| 12 | 0.13750 | 7.78860 | -0.04185 | -52.258 | 0.10808 | 0.203 | 0.13750 | -52.298 | 0.10808 |
| 13 | 0.28070 | 7.78910 | -0.06537 | -51.693 | 0.10911 | 0.249 | 0.28070 | -51.692 | 0.10911 |
| 14 | 0.42400 | 7.78980 | -0.08842 | -50.512 | 0.10620 | 0.327 | 0.42400 | -50.511 | 0.10620 |
| 15 | 0.56720 | 7.79080 | -0.11100 | -49.884 | 0.09702 | 0.374 | 0.56721 | -49.883 | 0.09702 |
| 16 | 0.71040 | 7.79160 | -0.13305 | -49.177 | 0.08223 | 0.359 | 0.71041 | -49.177 | 0.08223 |
| 17 | 0.85360 | 7.79260 | -0.15461 | -48.082 | 0.06292 | 0.396 | 0.85361 | -48.080 | 0.06292 |
| 18 | 0.99680 | 7.79380 | -0.17551 | -46.919 | 0.04050 | 0.693 | 0.99682 | -46.914 | 0.04050 |
| 19 | 1.11620 | 7.79520 | -0.19223 | -43.715 | 0.02062 | 1.083 | 1.11623 | -43.686 | 0.02062 |

MEANLINE INPUT DATA - STREAMLINE 5

| PT | Z | R | THETA | B* | T(Z) | PHI | X | B*M | T(M) |
|----|----------|---------|----------|---------|---------|-------|----------|---------|---------|
| 1 | -1.34560 | 7.76390 | 0.22853 | -50.990 | 0.02034 | 3.152 | -1.34730 | -50.948 | 0.02036 |
| 2 | -1.28220 | 7.76740 | 0.21782 | -51.445 | 0.02670 | 3.196 | -1.28380 | -51.401 | 0.02673 |
| 3 | -1.15540 | 7.77460 | 0.19590 | -52.326 | 0.03931 | 3.268 | -1.15680 | -52.281 | 0.03935 |
| 4 | -1.02860 | 7.78170 | 0.17330 | -53.170 | 0.05165 | 3.299 | -1.02979 | -53.125 | 0.05170 |
| 5 | -0.90180 | 7.78920 | 0.15003 | -54.003 | 0.06352 | 3.267 | -0.90278 | -53.959 | 0.06359 |
| 6 | -0.76240 | 7.79710 | 0.12360 | -54.945 | 0.07582 | 3.149 | -0.76316 | -54.904 | 0.07590 |
| 7 | -0.61020 | 7.80530 | 0.09388 | -55.594 | 0.08809 | 2.932 | -0.61074 | -55.559 | 0.08817 |
| 8 | -0.45810 | 7.81280 | 0.06403 | -55.155 | 0.09891 | 2.659 | -0.45845 | -55.126 | 0.09898 |
| 9 | -0.30600 | 7.81940 | 0.03529 | -53.649 | 0.10804 | 2.376 | -0.30621 | -53.626 | 0.10810 |
| 10 | -0.15380 | 7.82540 | 0.00846 | -51.537 | 0.11528 | 2.126 | -0.15390 | -51.518 | 0.11533 |
| 11 | 0.00170 | 7.83070 | -0.01649 | -49.841 | 0.12049 | 1.932 | -0.00170 | -49.825 | 0.12053 |
| 12 | 0.15040 | 7.83560 | -0.04032 | -48.936 | 0.12355 | 1.801 | 0.15048 | -48.922 | 0.12358 |
| 13 | 0.30260 | 7.84020 | -0.06351 | -48.233 | 0.12435 | 1.723 | 0.30275 | -48.220 | 0.12438 |
| 14 | 0.45470 | 7.84480 | -0.08613 | -47.569 | 0.11988 | 1.687 | 0.45492 | -47.556 | 0.11991 |
| 15 | 0.60680 | 7.84920 | -0.10824 | -46.953 | 0.10857 | 1.678 | 0.60708 | -46.940 | 0.10859 |
| 16 | 0.75900 | 7.85360 | -0.12985 | -46.273 | 0.09121 | 1.673 | 0.75935 | -46.260 | 0.09123 |
| 17 | 0.91110 | 7.85810 | -0.15089 | -45.465 | 0.06898 | 1.764 | 0.91152 | -45.451 | 0.06900 |
| 18 | 1.06330 | 7.86330 | -0.17129 | -44.543 | 0.04143 | 2.126 | 1.06380 | -44.524 | 0.04144 |
| 19 | 1.19000 | 7.86790 | -0.18776 | -43.715 | 0.02086 | 2.570 | 1.19061 | -43.686 | 0.02087 |

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 6

| PT | Z | R | THETA | R* | T(7) | PHI | X | B*M | T(M) |
|----|----------|---------|----------|---------|---------|-------|----------|---------|---------|
| 1 | -1.41430 | 6.93800 | 0.21267 | -49.878 | 0.02048 | 4.875 | -1.41947 | -49.775 | 0.02052 |
| 2 | -1.34760 | 6.94390 | 0.22117 | -50.314 | 0.02849 | 4.974 | -1.35253 | -50.208 | 0.02855 |
| 3 | -1.21400 | 6.95570 | 0.19766 | -51.158 | 0.04438 | 5.152 | -1.21840 | -51.044 | 0.04445 |
| 4 | -1.08050 | 6.96790 | 0.17350 | -51.948 | 0.05990 | 5.275 | -1.08435 | -51.830 | 0.06006 |
| 5 | -0.94700 | 6.98040 | 0.14871 | -52.667 | 0.07480 | 5.313 | -0.95027 | -52.548 | 0.07500 |
| 6 | -0.80010 | 6.99410 | 0.12080 | -53.327 | 0.09021 | 5.232 | -0.80375 | -53.212 | 0.09045 |
| 7 | -0.63980 | 7.00860 | 0.08994 | -53.336 | 0.10550 | 5.031 | -0.64180 | -53.230 | 0.10576 |
| 8 | -0.47960 | 7.02230 | 0.05998 | -51.757 | 0.11888 | 4.793 | -0.48101 | -51.659 | 0.11914 |
| 9 | -0.31940 | 7.03530 | 0.03223 | -49.428 | 0.13005 | 4.527 | -0.32027 | -49.340 | 0.13028 |
| 10 | -0.15910 | 7.04780 | 0.00650 | -47.707 | 0.13876 | 4.229 | -0.15951 | -47.629 | 0.13897 |
| 11 | 0.00110 | 7.05920 | -0.01794 | -46.547 | 0.14480 | 3.943 | 0.00110 | -46.479 | 0.14498 |
| 12 | 0.16140 | 7.06970 | -0.04151 | -45.663 | 0.14806 | 3.714 | 0.16176 | -45.603 | 0.14822 |
| 13 | 0.32160 | 7.07990 | -0.06436 | -44.854 | 0.14809 | 3.571 | 0.32228 | -44.798 | 0.14823 |
| 14 | 0.48180 | 7.08980 | -0.08656 | -44.071 | 0.14106 | 3.483 | 0.48279 | -44.018 | 0.14119 |
| 15 | 0.64210 | 7.09940 | -0.10814 | -43.307 | 0.12637 | 3.422 | 0.64338 | -43.256 | 0.12648 |
| 16 | 0.80230 | 7.10880 | -0.12910 | -42.486 | 0.10496 | 3.434 | 0.80386 | -42.435 | 0.10505 |
| 17 | 0.96260 | 7.11860 | -0.14942 | -41.604 | 0.07819 | 3.599 | 0.96446 | -41.547 | 0.07826 |
| 18 | 1.12280 | 7.12930 | -0.16908 | -40.732 | 0.04776 | 4.000 | 1.12501 | -40.663 | 0.04781 |
| 19 | 1.25630 | 7.13860 | -0.18500 | -40.014 | 0.02102 | 4.448 | 1.25888 | -39.929 | 0.02105 |

MEANLINE INPUT DATA - STREAMLINE 7

| PT | Z | R | THETA | R* | T(7) | PHI | X | R*M | T(M) |
|----|----------|---------|----------|---------|----------|-------|----------|---------|---------|
| 1 | -1.47980 | 6.47660 | 0.23549 | -48.937 | 0.02013 | 6.882 | -1.49130 | -48.731 | 0.02021 |
| 2 | -1.40990 | 6.48540 | 0.22302 | -49.363 | 0.03045 | 7.027 | -1.42088 | -49.150 | 0.03058 |
| 3 | -1.27010 | 6.50300 | 0.19759 | -50.135 | 0.05092 | 7.284 | -1.27998 | -49.906 | 0.05116 |
| 4 | -1.13040 | 6.52110 | 0.17160 | -50.703 | 0.07090 | 7.453 | -1.13912 | -50.465 | 0.07126 |
| 5 | -0.99060 | 6.53950 | 0.14529 | -50.991 | 0.09004 | 7.514 | -0.99811 | -50.749 | 0.09051 |
| 6 | -0.83680 | 6.55980 | 0.11630 | -50.915 | 0.10978 | 7.478 | -0.84299 | -50.675 | 0.11034 |
| 7 | -0.66910 | 6.58180 | 0.08523 | -50.123 | 0.12928 | 7.335 | -0.67387 | -49.891 | 0.12990 |
| 8 | -0.50130 | 6.60310 | 0.05566 | -48.268 | 0.14622 | 7.096 | -0.50473 | -48.049 | 0.14685 |
| 9 | -0.33360 | 6.62350 | 0.02835 | -45.972 | 0.16021 | 6.817 | -0.33578 | -45.769 | 0.16080 |
| 10 | -0.16580 | 6.64320 | 0.00305 | -44.135 | 0.17092* | 6.539 | -0.16684 | -43.948 | 0.17146 |
| 11 | 0.00190 | 6.66200 | -0.02081 | -42.754 | 0.17810 | 6.245 | 0.00191 | -42.584 | 0.17859 |
| 12 | 0.16960 | 6.67990 | -0.04360 | -41.671 | 0.18157 | 5.961 | 0.17057 | -41.517 | 0.18200 |
| 13 | 0.33740 | 6.69700 | -0.06556 | -40.756 | 0.18027 | 5.763 | 0.33925 | -40.613 | 0.18066 |
| 14 | 0.50510 | 6.71370 | -0.08680 | -39.911 | 0.16999 | 5.660 | 0.50778 | -39.773 | 0.17033 |
| 15 | 0.67290 | 6.73030 | -0.10737 | -39.071 | 0.15083 | 5.641 | 0.67640 | -38.935 | 0.15112 |
| 16 | 0.84060 | 6.74680 | -0.12728 | -38.233 | 0.12392 | 5.717 | 0.84492 | -38.094 | 0.12416 |
| 17 | 1.00840 | 6.76370 | -0.14655 | -37.385 | 0.09089 | 5.935 | 1.01353 | -37.236 | 0.09107 |
| 18 | 1.17610 | 6.78190 | -0.16517 | -36.502 | 0.05368 | 6.353 | 1.18225 | -36.374 | 0.05380 |
| 19 | 1.31590 | 6.79770 | -0.18020 | -35.740 | 0.02110 | 6.795 | 1.32298 | -35.549 | 0.02115 |

PHASE III ROTOR

NR 20

MEANLINE INPUT DATA - STREAMLINE

MEANLINE INPUT DATA - STREAMLINE

| PT | Z | R | THETA | R* | T(7) | Phi | X | B*M | T(M) |
|----|----------|---------|----------|---------|---------|-------|----------|---------|---------|
| 1 | -1.53950 | 5.96840 | 0.23715 | -48.024 | 0.01915 | 9.193 | -1.56132 | -47.655 | 0.01929 |
| 2 | -1.46680 | 5.98050 | 0.22356 | -48.299 | 0.03197 | 9.378 | -1.48765 | -47.916 | 0.03221 |
| 3 | -1.32140 | 6.00490 | 0.19510 | -48.744 | 0.05739 | 9.707 | 1.34021 | 48.334 | 0.05786 |
| 4 | -1.17610 | 6.03010 | 0.16846 | -48.891 | 0.08216 | 9.919 | -1.19275 | -48.463 | 0.08286 |
| 5 | -1.03070 | 6.05580 | 0.14098 | -48.635 | 0.10586 | 9.989 | -1.04512 | -48.200 | 0.10677 |
| 6 | -0.87080 | 6.08400 | 0.11143 | -47.837 | 0.13021 | 9.934 | -0.88277 | -47.406 | 0.13129 |
| 7 | -0.69630 | 6.11440 | 0.08063 | -46.248 | 0.15414 | 9.771 | -0.70565 | -45.830 | 0.15531 |
| 8 | -0.52190 | 6.14410 | 0.05206 | -43.840 | 0.17476 | 9.561 | -0.52874 | -43.440 | 0.17593 |
| 9 | -0.34740 | 6.17320 | 0.02605 | -41.350 | 0.19158 | 9.338 | -0.35184 | -40.972 | 0.19269 |
| 10 | -0.17300 | 6.20150 | 0.00203 | -39.623 | 0.20417 | 9.110 | -0.17515 | -39.266 | 0.20522 |
| 11 | 0.00150 | 6.22910 | -0.02058 | -38.348 | 0.21221 | 8.865 | -0.00152 | -38.014 | 0.21319 |
| 12 | 0.17590 | 6.25600 | -0.04233 | -37.208 | 0.21553 | 8.617 | 0.17797 | -36.895 | 0.21642 |
| 13 | 0.35040 | 6.28200 | -0.06305 | -36.130 | 0.21207 | 8.414 | 0.35441 | -35.836 | 0.21286 |
| 14 | 0.52480 | 6.30740 | -0.08290 | -35.101 | 0.19808 | 8.299 | 0.53068 | -34.818 | 0.19877 |
| 15 | 0.69930 | 6.33280 | -0.10195 | -34.109 | 0.17424 | 8.312 | 0.70702 | -33.828 | 0.17482 |
| 16 | 0.87370 | 6.35840 | -0.12022 | -33.101 | 0.14188 | 8.488 | 0.88331 | -32.812 | 0.14234 |
| 17 | 1.04620 | 6.38470 | -0.13772 | -32.078 | 0.10280 | 8.818 | 1.05981 | -31.772 | 0.10314 |
| 18 | 1.22260 | 6.41270 | -0.15448 | -31.094 | 0.05917 | 9.247 | 1.23640 | -30.764 | 0.05937 |
| 19 | 1.36800 | 6.43680 | -0.16791 | -30.289 | 0.02109 | 9.642 | 1.38380 | -29.936 | 0.02117 |

MEANLINE INPUT DATA - STREAMLINE

| PT | Z | R | THETA | R* | T(7) | Phi | X | B*M | T(M) |
|----|----------|---------|----------|---------|---------|--------|----------|---------|---------|
| 1 | -1.57750 | 5.39540 | 0.23554 | -46.985 | 0.01860 | 12.228 | -1.61594 | -46.328 | 0.01883 |
| 2 | -1.50250 | 5.41220 | 0.22067 | -46.948 | 0.03390 | 12.414 | -1.53917 | -46.271 | 0.03433 |
| 3 | -1.35250 | 5.44590 | 0.19116 | -46.805 | 0.06423 | 12.729 | -1.38548 | -46.093 | 0.06508 |
| 4 | 1.20250 | 5.48000 | 0.16207 | -46.452 | 0.09374 | 12.873 | -1.23165 | -45.724 | 0.09499 |
| 5 | -1.05250 | 5.51430 | 0.13371 | -45.665 | 0.12191 | 12.841 | -1.07778 | -44.939 | 0.12348 |
| 6 | -0.88760 | 5.55180 | 0.10401 | -43.906 | 0.15074 | 12.735 | -0.90869 | -43.193 | 0.15253 |
| 7 | -0.70760 | 5.59230 | 0.07434 | -41.162 | 0.17891 | 12.611 | -0.72419 | -40.470 | 0.18079 |
| 8 | -0.52760 | 5.63230 | 0.04754 | -38.694 | 0.20297 | 12.465 | -0.53979 | -38.029 | 0.20484 |
| 9 | -0.34760 | 5.67190 | 0.02294 | -36.727 | 0.22227 | 12.291 | -0.35551 | -36.092 | 0.22409 |
| 10 | -0.16760 | 5.71080 | 0.00010 | -34.972 | 0.23633 | 12.099 | -0.17135 | -34.370 | 0.23805 |
| 11 | 0.01240 | 5.74900 | -0.02121 | -33.320 | 0.24479 | 11.913 | 0.01267 | -32.750 | 0.24638 |
| 12 | 0.19240 | 5.78670 | -0.04112 | -31.790 | 0.24743 | 11.764 | 0.19658 | -31.248 | 0.24887 |
| 13 | 0.37240 | 5.82400 | -0.05984 | -30.484 | 0.24096 | 11.680 | 0.38041 | -29.963 | 0.24224 |
| 14 | 0.55230 | 5.86110 | -0.07755 | -29.326 | 0.22309 | 11.677 | 0.56411 | -28.817 | 0.22419 |
| 15 | 0.73230 | 5.89830 | -0.09435 | -28.182 | 0.19475 | 11.782 | 0.74794 | -27.677 | 0.19566 |
| 16 | 0.91230 | 5.93610 | -0.11026 | -27.042 | 0.15740 | 12.060 | 0.93190 | -26.528 | 0.15812 |
| 17 | 1.09230 | 5.97510 | -0.12531 | -25.885 | 0.11299 | 12.463 | 1.11610 | -25.352 | 0.11349 |
| 18 | 1.27230 | 6.01570 | -0.13949 | -24.657 | 0.06381 | 12.832 | 1.30058 | -24.112 | 0.06409 |
| 19 | 1.42230 | 6.05050 | -0.15062 | -23.580 | 0.02102 | 13.104 | 1.45451 | -23.030 | 0.02111 |

PHASE III ROTOR

NR 20

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 10

| PT | Z | R | THETA | R* | T(Z) | PHI | X | B*M | T(M) |
|----|----------|---------|----------|---------|---------|--------|----------|---------|---------|
| 1 | -1.55230 | 4.73400 | 0.22877 | -45.415 | 0.02077 | 16.114 | -1.61706 | -44.267 | 0.02119 |
| 2 | -1.47620 | 4.75660 | 0.21254 | 45.263 | 0.03828 | 16.269 | -1.53781 | -44.092 | 0.03906 |
| 3 | -1.32400 | 4.80180 | 0.18064 | -44.756 | 0.07298 | 16.522 | -1.37915 | 43.549 | 0.07449 |
| 4 | -1.17170 | 4.84710 | 0.14988 | -43.647 | 0.10670 | 16.613 | -1.22024 | 42.428 | 0.10884 |
| 5 | -1.01950 | 4.89230 | 0.12094 | -41.830 | 0.13880 | 16.549 | -1.06143 | -40.629 | 0.14137 |
| 6 | -0.85210 | 4.94190 | 0.09174 | -39.326 | 0.17153 | 16.434 | -0.88685 | -38.160 | 0.17436 |
| 7 | -0.66940 | 4.99580 | 0.06313 | -36.459 | 0.20329 | 16.302 | -0.69643 | -35.342 | 0.20618 |
| 8 | -0.48680 | 5.04880 | 0.03749 | -33.966 | 0.23012 | 16.110 | -0.50627 | -32.911 | 0.23294 |
| 9 | -0.30410 | 5.10120 | 0.01422 | -31.808 | 0.25127 | 15.943 | -0.31619 | 30.810 | 0.25395 |
| 10 | -0.12140 | 5.15320 | -0.00699 | -29.732 | 0.26619 | 15.885 | -0.12622 | -28.781 | 0.26868 |
| 11 | 0.06120 | 5.20510 | -0.02633 | -27.767 | 0.27446 | 15.886 | 0.06363 | -26.857 | 0.27672 |
| 12 | 0.24390 | 5.25710 | -0.04401 | -25.962 | 0.27563 | 15.925 | 0.25360 | -25.090 | 0.27764 |
| 13 | 0.42660 | 5.30930 | -0.06023 | -24.326 | 0.26584 | 16.025 | 0.44363 | -23.484 | 0.26758 |
| 14 | 0.60920 | 5.36200 | -0.07516 | -22.787 | 0.24421 | 16.202 | 0.63369 | -21.970 | 0.24565 |
| 15 | 0.79190 | 5.41540 | -0.08887 | -21.253 | 0.21179 | 16.486 | 0.82407 | -20.453 | 0.21292 |
| 16 | 0.97460 | 5.47020 | -0.10140 | -19.668 | 0.17015 | 16.932 | 1.01482 | -18.877 | 0.17097 |
| 17 | 1.15720 | 5.52650 | -0.11273 | -17.956 | 0.12130 | 17.399 | 1.20595 | -17.184 | 0.12182 |
| 18 | 1.33990 | 5.58440 | -0.12279 | -16.027 | 0.06760 | 17.596 | 1.39753 | -15.313 | 0.06784 |
| 19 | 1.49210 | 5.63350 | -0.13014 | -14.281 | 0.02102 | 17.603 | 1.55721 | -13.638 | 0.02108 |

MEANLINE INPUT DATA - SURFAMLINE 11

| PT | Z | R | THETA | R* | T(Z) | PHI | X | B*M | T(M) |
|----|----------|---------|----------|---------|---------|--------|----------|---------|---------|
| 1 | -1.49560 | 3.90490 | 0.22116 | -42.968 | 0.02535 | 21.672 | -1.60872 | -40.880 | 0.02619 |
| 2 | -1.42020 | 3.93560 | 0.20338 | -42.581 | 0.04322 | 21.849 | -1.52754 | -40.462 | 0.04466 |
| 3 | -1.26960 | 3.99690 | 0.16904 | -41.589 | 0.07865 | 22.120 | -1.36511 | -39.427 | 0.08123 |
| 4 | -1.11900 | 4.05820 | 0.13669 | -39.987 | 0.11319 | 22.156 | -1.20250 | -37.839 | 0.11667 |
| 5 | -0.96830 | 4.11920 | 0.10696 | -37.712 | 0.14624 | 21.971 | -1.03988 | 35.643 | 0.15023 |
| 6 | -0.80270 | 4.18570 | 0.07764 | -34.858 | 0.18022 | 21.715 | -0.86147 | 32.906 | 0.18439 |
| 7 | -0.62190 | 4.25730 | 0.04953 | -31.675 | 0.21366 | 21.471 | -0.66703 | -29.864 | 0.21772 |
| 8 | -0.44110 | 4.32790 | 0.02511 | -28.538 | 0.24252 | 21.247 | -0.47290 | -26.878 | 0.24624 |
| 9 | -0.26040 | 4.39780 | 0.00398 | -25.509 | 0.26611 | 21.105 | -0.27912 | 23.997 | 0.26937 |
| 10 | -0.07960 | 4.46740 | -0.01424 | -22.669 | 0.28384 | 21.109 | -0.08534 | -21.288 | 0.28661 |
| 11 | 0.10110 | 4.53730 | -0.02998 | -20.202 | 0.29530 | 21.254 | 0.10844 | -18.929 | 0.29764 |
| 12 | 0.28190 | 4.60800 | -0.04367 | -17.989 | 0.30020 | 21.553 | 0.30261 | -16.805 | 0.30215 |
| 13 | 0.46270 | 4.68000 | -0.05545 | -15.625 | 0.29575 | 22.041 | 0.49731 | -14.533 | 0.29727 |
| 14 | 0.64340 | 4.75420 | -0.06529 | -13.181 | 0.27610 | 22.696 | 0.69270 | -12.192 | 0.27717 |
| 15 | 0.82420 | 4.83120 | -0.07330 | -10.811 | 0.24210 | 23.455 | 0.88922 | -9.936 | 0.24278 |
| 16 | 1.00490 | 4.91130 | -0.07938 | -8.326 | 0.19567 | 24.203 | 1.08677 | -7.603 | 0.19602 |
| 17 | 1.18570 | 4.99370 | -0.08405 | -5.604 | 0.13943 | 24.657 | 1.28542 | -5.096 | 0.13955 |
| 18 | 1.36650 | 5.07670 | -0.08666 | -2.666 | 0.07654 | 24.468 | 1.48429 | -2.427 | 0.07655 |
| 19 | 1.51710 | 5.14590 | -0.08737 | -0.092 | 0.02162 | 23.990 | 1.64946 | -0.084 | 0.02162 |

MERIDIONAL AIRFOIL GEOMETRY

MEANLINE INPUT DATA - STREAMLINE 12

| PT | Z | R | THETA | R' | T(Z) | PHI | X | B'M | T(M) |
|----|----------|---------|----------|---------|---------|--------|----------|---------|---------|
| 1 | -1.47580 | 3.36160 | 0.22120 | -41.143 | 0.03326 | 25.961 | -1.63314 | -38.150 | 0.03473 |
| 2 | -1.40200 | 3.39840 | 0.20236 | 40.501 | 0.05440 | 26.022 | -1.55103 | -37.507 | 0.05675 |
| 3 | -1.25460 | 3.47150 | 0.15660 | -39.029 | 0.09624 | 26.054 | -1.38696 | -36.064 | 0.10015 |
| 4 | -1.10720 | 3.54320 | 0.13360 | -37.132 | 0.13669 | 25.825 | -1.22301 | -34.277 | 0.14169 |
| 5 | -0.95970 | 3.61350 | 0.10366 | -34.788 | 0.17483 | 25.399 | -1.05943 | -32.111 | 0.18031 |
| 6 | -0.79750 | 3.68970 | 0.07438 | -31.968 | 0.21313 | 25.053 | -0.88016 | -29.483 | 0.21870 |
| 7 | -0.62060 | 3.77210 | 0.04653 | -28.845 | 0.24978 | 24.934 | -0.68501 | -26.539 | 0.25470 |
| 8 | -0.44370 | 3.85420 | 0.02257 | -25.764 | 0.27874 | 24.923 | -0.48095 | -23.639 | 0.28354 |
| 9 | -0.26670 | 3.93640 | 0.00209 | -22.765 | 0.30026 | 25.014 | -0.29472 | -20.821 | 0.30436 |
| 10 | -0.08980 | 4.01930 | -0.01527 | -19.884 | 0.31326 | 25.242 | -0.09934 | -18.115 | 0.31661 |
| 11 | 0.08710 | 4.10320 | -0.02988 | -17.229 | 0.31732 | 25.572 | -0.09649 | -15.628 | 0.31995 |
| 12 | 0.26400 | 4.18860 | -0.04210 | -14.718 | 0.31134 | 26.046 | 0.29296 | -13.279 | 0.31330 |
| 13 | 0.44100 | 4.27610 | -0.05208 | -12.077 | 0.29474 | 26.761 | 0.49054 | -10.816 | 0.29606 |
| 14 | 0.61790 | 4.36670 | -0.05985 | -9.416 | 0.26819 | 27.611 | 0.68941 | -8.360 | 0.26896 |
| 15 | 0.79480 | 4.46120 | -0.06556 | -6.724 | 0.23274 | 28.463 | 0.88983 | 5.917 | 0.23310 |
| 16 | 0.97180 | 4.55920 | -0.06903 | 3.165 | 0.18978 | 29.304 | 1.09200 | -2.761 | 0.18985 |
| 17 | 1.14870 | 4.65960 | -0.06965 | 1.438 | 0.14102 | 29.776 | 1.29545 | 1.248 | 0.14103 |
| 18 | 1.32560 | 4.76030 | -0.06709 | 6.393 | 0.08838 | 29.280 | 1.49892 | 5.582 | 0.08851 |
| 19 | 1.47310 | 4.84420 | -0.06251 | 10.587 | 0.04306 | 28.357 | 1.65731 | 9.341 | 0.04322 |

MEANLINE INPUT DATA - STREAMLINE 13

| PT | Z | R | THETA | R' | T(Z) | PHI | X | B'M | T(M) |
|----|----------|---------|----------|---------|---------|--------|----------|---------|---------|
| 1 | -1.45600 | 2.65330 | 0.23827 | -36.479 | 0.05041 | 31.199 | -1.67260 | -32.312 | 0.05299 |
| 2 | -1.38530 | 2.69470 | 0.21884 | -36.105 | 0.06966 | 30.603 | -1.59021 | -32.119 | 0.07302 |
| 3 | -1.24380 | 2.77680 | 0.18170 | -35.204 | 0.10782 | 29.513 | -1.42675 | -31.549 | 0.11245 |
| 4 | -1.10230 | 2.85610 | 0.14701 | -33.975 | 0.14492 | 28.724 | -1.26482 | -30.581 | 0.15045 |
| 5 | -0.96080 | 2.93290 | 0.11503 | -32.310 | 0.18023 | 28.302 | -1.10383 | -29.110 | 0.18631 |
| 6 | -0.80510 | 3.01620 | 0.08337 | -29.910 | 0.21622 | 28.181 | -0.92714 | -26.888 | 0.22248 |
| 7 | -0.63530 | 3.10760 | 0.05341 | -26.755 | 0.25119 | 28.431 | -0.73434 | -23.910 | 0.25717 |
| 8 | -0.46550 | 3.20060 | 0.02816 | -23.484 | 0.28074 | 29.100 | -0.54070 | -20.788 | 0.28617 |
| 9 | -0.29570 | 3.29700 | 0.00708 | -20.497 | 0.30408 | 30.104 | 0.34545 | -17.921 | 0.30888 |
| 10 | -0.12590 | 3.39790 | -0.01061 | -17.993 | 0.32058 | 31.281 | -0.14799 | -15.514 | 0.32479 |
| 11 | 0.04390 | 3.50340 | -0.03551 | -15.680 | 0.32978 | 32.389 | 0.05191 | 13.335 | 0.33329 |
| 12 | 0.21370 | 3.61310 | -0.03782 | -13.161 | 0.33130 | 33.335 | 0.25409 | 11.054 | 0.33392 |
| 13 | 0.38350 | 3.72660 | -0.04739 | -10.054 | 0.32241 | 34.186 | 0.45835 | -8.344 | 0.32397 |
| 14 | 0.55330 | 3.84380 | -0.05382 | -6.069 | 0.30253 | 35.003 | 0.66462 | -4.977 | 0.30309 |
| 15 | 0.72310 | 3.96430 | -0.05659 | -0.993 | 0.27265 | 35.786 | 0.87294 | -0.805 | 0.27266 |
| 16 | 0.89290 | 4.08930 | -0.05510 | 5.240 | 0.23419 | 36.379 | 1.08311 | 4.223 | 0.23453 |
| 17 | 1.06270 | 4.21400 | -0.04884 | 12.253 | 0.18905 | 36.561 | 1.29439 | 9.896 | 0.19058 |
| 18 | 1.23250 | 4.33860 | -0.03760 | 19.299 | 0.13944 | 36.136 | 1.50533 | 15.791 | 0.14217 |
| 19 | 1.37400 | 4.44150 | -0.02448 | 24.952 | 0.09632 | 35.488 | 1.67085 | 20.750 | 0.09935 |

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 1

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | | | | | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|----------|----------|---------------------|--|--|--|--|--|--|--|--|--|
| PT | PCT X | X | Y | R·M | T(M) | PT | X S | Y S | XP | YP | | | | | | | | | |
| 1 | 0. | -1.11520 | 1.78797 | -54.985 | 0.01884 | 1 | -1.11520 | 1.78797 | -1.11520 | 1.78797 | | | | | | | | | |
| 2 | 0.02500 | -1.06431 | 1.71457 | 55.545 | 0.02331 | 2 | -1.11923 | 1.78139 | -1.10749 | 1.78946 | | | | | | | | | |
| 3 | 0.05000 | -1.01343 | 1.63963 | 56.097 | 0.02776 | 3 | -1.11772 | 1.77472 | -1.10189 | 1.78578 | | | | | | | | | |
| 4 | 0.07500 | -0.96254 | 1.56312 | 56.645 | 0.03219 | 4 | -1.07392 | 1.70797 | -1.05470 | 1.72116 | | | | | | | | | |
| 5 | 0.10000 | -0.91165 | 1.48500 | -57.196 | 0.03658 | 5 | -1.02495 | 1.63188 | -1.00190 | 1.64737 | | | | | | | | | |
| 6 | 0.12500 | -0.86076 | 1.41520 | -57.756 | 0.04090 | 6 | -0.97598 | 1.55427 | -0.94910 | 1.57197 | | | | | | | | | |
| 7 | 0.15000 | -0.80988 | 1.32362 | -58.333 | 0.04515 | 7 | -0.92702 | 1.47509 | -0.89628 | 1.49490 | | | | | | | | | |
| 8 | 0.17500 | -0.75899 | 1.24014 | 58.943 | 0.04930 | 8 | -0.87806 | 1.39428 | -0.84347 | 1.41611 | | | | | | | | | |
| 9 | 0.20000 | -0.70810 | 1.15455 | -59.596 | 0.05336 | 9 | -0.82909 | 1.31177 | -0.79066 | 1.33547 | | | | | | | | | |
| 10 | 0.23000 | -0.64704 | 1.04876 | -60.414 | 0.05808 | 10 | 0.78010 | 1.22742 | -0.73787 | 1.25286 | | | | | | | | | |
| 11 | 0.26000 | -0.58597 | 0.93937 | -61.235 | 0.06260 | 11 | 0.73111 | 1.14104 | -0.68509 | 1.16805 | | | | | | | | | |
| 12 | 0.29000 | -0.52491 | 0.82630 | -62.004 | 0.06692 | 12 | -0.67229 | 1.03442 | -0.62178 | 1.06310 | | | | | | | | | |
| 13 | 0.32000 | -0.46384 | 0.70975 | -62.671 | 0.07101 | 13 | -0.61341 | 0.92431 | -0.55853 | 0.95443 | | | | | | | | | |
| 14 | 0.35000 | -0.40278 | 0.59018 | -63.192 | 0.07484 | 14 | -0.55445 | 0.81060 | -0.49536 | 0.84201 | | | | | | | | | |
| 15 | 0.38000 | -0.34171 | 0.46835 | -63.531 | 0.07840 | 15 | -0.49538 | 0.69345 | -0.43230 | 0.72605 | | | | | | | | | |
| 16 | 0.41000 | -0.28065 | 0.34526 | -63.660 | 0.08168 | 16 | -0.43617 | 0.57331 | -0.36938 | 0.60706 | | | | | | | | | |
| 17 | 0.44000 | -0.21958 | 0.22209 | -63.560 | 0.08466 | 17 | 0.37680 | 0.45088 | -0.30662 | 0.48583 | | | | | | | | | |
| 18 | 0.47000 | -0.15852 | 0.10001 | -63.265 | 0.08732 | 18 | -0.31724 | 0.32714 | -0.24405 | 0.36338 | | | | | | | | | |
| 19 | 0.50000 | -0.09745 | -0.02012 | -62.819 | 0.08965 | 19 | -0.25748 | 0.20325 | -0.18168 | 0.24094 | | | | | | | | | |
| 20 | 0.53000 | -0.03639 | -0.13766 | -62.262 | 0.09163 | 20 | -0.19751 | 0.08037 | -0.11952 | 0.11965 | | | | | | | | | |
| 21 | 0.56000 | 0.02468 | -0.25231 | -61.647 | 0.09327 | 21 | -0.13732 | -0.04059 | -0.05758 | 0.00036 | | | | | | | | | |
| 22 | 0.59000 | 0.08574 | -0.36405 | -61.049 | 0.09454 | 22 | -0.07694 | -0.15899 | 0.00417 | -0.11634 | | | | | | | | | |
| 23 | 0.62000 | 0.14681 | -0.47326 | -60.544 | 0.09544 | 23 | -0.01636 | -0.27445 | 0.06572 | -0.23016 | | | | | | | | | |
| 24 | 0.65000 | 0.20787 | -0.58045 | -60.131 | 0.09600 | 24 | 0.04438 | -0.38693 | 0.12711 | -0.34117 | | | | | | | | | |
| 25 | 0.68000 | 0.26894 | -0.68603 | -59.788 | 0.09616 | 25 | 0.10526 | -0.49672 | 0.18836 | -0.44979 | | | | | | | | | |
| 26 | 0.71000 | 0.33000 | -0.79025 | -59.478 | 0.09529 | 26 | 0.16625 | -0.60436 | 0.24950 | -0.55655 | | | | | | | | | |
| 27 | 0.74000 | 0.39107 | -0.89319 | -59.170 | 0.09279 | 27 | 0.22739 | -0.71022 | 0.31049 | -0.66184 | | | | | | | | | |
| 28 | 0.77000 | 0.45213 | -0.99490 | -58.874 | 0.08866 | 28 | 0.28896 | -0.81444 | 0.37105 | -0.76605 | | | | | | | | | |
| 29 | 0.80000 | 0.51320 | -1.09548 | -58.602 | 0.08305 | 29 | 0.35123 | -0.91697 | 0.43091 | -0.86942 | | | | | | | | | |
| 30 | 0.83000 | 0.57426 | -1.19501 | -58.332 | 0.07609 | 30 | 0.41419 | -1.01782 | 0.49008 | -0.97199 | | | | | | | | | |
| 31 | 0.86000 | 0.63533 | -1.29344 | -58.023 | 0.06791 | 31 | 0.47775 | -1.11712 | 0.54865 | -1.07385 | | | | | | | | | |
| 32 | 0.89000 | 0.69639 | -1.39048 | -57.586 | 0.05867 | 32 | 0.54188 | -1.21498 | 0.60665 | -1.17503 | | | | | | | | | |
| 33 | 0.92000 | 0.75746 | -1.48553 | -56.940 | 0.04858 | 33 | 0.60653 | -1.31142 | 0.66413 | -1.27545 | | | | | | | | | |
| 34 | 0.95000 | 0.81853 | -1.57790 | -56.089 | 0.03786 | 34 | 0.67163 | -1.40620 | 0.72116 | -1.37476 | | | | | | | | | |
| 35 | 0.97500 | 0.86941 | -1.65244 | -55.248 | 0.02861 | 35 | 0.73710 | -1.49878 | 0.77782 | -1.47228 | | | | | | | | | |
| 36 | 1.00000 | 0.92030 | -1.72456 | -54.322 | 0.01923 | 36 | 0.80282 | -1.58846 | 0.83423 | -1.56734 | | | | | | | | | |
| 37 | | | | | | 37 | 0.85766 | -1.66060 | 0.88117 | -1.64429 | | | | | | | | | |
| 38 | | | | | | 38 | 0.90647 | -1.72265 | 0.92295 | -1.71086 | | | | | | | | | |
| 39 | | | | | | 39 | 0.91229 | -1.72624 | 0.92443 | -1.71778 | | | | | | | | | |
| 40 | | | | | | 40 | 0.92030 | -1.72456 | 0.92030 | -1.72456 | | | | | | | | | |

CHORD 4 05969 CAMBER 0.663 STAGGER 59 908

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 3

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | | | | | | | |
|---------------|---------|----------|----------|---------|---------|-----|----------|----------|----------|---------------------|--|--|--|--|--|--|--|--|--|
| PT | PCT X | X | Y | B·M | T (M) | P·T | X S | Y S | X P | Y P | | | | | | | | | |
| 1 | 0 | -1 19136 | 1 76137 | -53 626 | 0 01946 | 1 | -1 19136 | 1 76137 | 1 19136 | 1 76137 | | | | | | | | | |
| 2 | 0 02500 | -1 13584 | 1 68519 | -54 201 | 0 02420 | 2 | -1 19536 | 1 75447 | 1 18343 | 1 76310 | | | | | | | | | |
| 3 | 0 05000 | -1 08032 | 1 60740 | -54 766 | 0 02894 | 3 | -1 19363 | 1 74763 | -1 17756 | 1 75944 | | | | | | | | | |
| 4 | 0 07500 | -1 02481 | 1 52798 | -55 321 | 0 03365 | 4 | -1 14566 | 1 67811 | -1 12602 | 1 69227 | | | | | | | | | |
| 5 | 0 10000 | -0 96929 | 1 44691 | -55 870 | 0 03830 | 5 | -1 09214 | 1 59905 | -1 06850 | 1 61575 | | | | | | | | | |
| 6 | 0 12500 | -0 91377 | 1 36416 | -56 415 | 0 04289 | 6 | -1 03864 | 1 51841 | -1 01097 | 1 53756 | | | | | | | | | |
| 7 | 0 15000 | -0 85825 | 1 27969 | -56 956 | 0 04740 | 7 | -0 98514 | 1 43617 | -0 95344 | 1 45766 | | | | | | | | | |
| 8 | 0 17500 | -0 80274 | 1 19345 | -57 497 | 0 05180 | 8 | -0 93164 | 1 35230 | -0 89591 | 1 37602 | | | | | | | | | |
| 9 | 0 20000 | -0 74722 | 1 10540 | -58 038 | 0 05609 | 9 | -0 87812 | 1 26676 | -0 83839 | 1 29261 | | | | | | | | | |
| 10 | 0 23000 | -0 68060 | 0 99728 | -58 677 | 0 06106 | 10 | -0 82458 | 1 17953 | 0 78089 | 1 20737 | | | | | | | | | |
| 11 | 0 26000 | -0 61398 | 0 88646 | -59 286 | 0 06582 | 11 | -0 77101 | 1 09055 | -0 72343 | 1 12024 | | | | | | | | | |
| 12 | 0 29000 | -0 54736 | 0 77303 | -59 849 | 0 07035 | 12 | -0 70668 | 0 98141 | -0 65452 | 1 01315 | | | | | | | | | |
| 13 | 0 32000 | -0 48074 | 0 65716 | -60 337 | 0 07462 | 13 | -0 64227 | 0 86966 | -0 58569 | 0 90327 | | | | | | | | | |
| 14 | 0 35000 | -0 41412 | 0 53930 | -60 678 | 0 07861 | 14 | -0 57777 | 0 75536 | -0 51694 | 0 79070 | | | | | | | | | |
| 15 | 0 38000 | -0 34750 | 0 42030 | -60 797 | 0 08230 | 15 | -0 51316 | 0 63870 | -0 44832 | 0 67563 | | | | | | | | | |
| 16 | 0 41000 | -0 28087 | 0 30138 | -60 631 | 0 08567 | 16 | -0 44839 | 0 52005 | 0 37985 | 0 55855 | | | | | | | | | |
| 17 | 0 44000 | -0 21425 | 0 18407 | -60 137 | 0 08870 | 17 | -0 38342 | 0 40022 | 0 31158 | 0 44038 | | | | | | | | | |
| 18 | 0 47000 | -0 14763 | 0 06964 | -59 416 | 0 09139 | 18 | -0 31820 | 0 28038 | -0 24354 | 0 32239 | | | | | | | | | |
| 19 | 0 50000 | -0 08101 | -0 04129 | -58 597 | 0 09370 | 19 | -0 25272 | 0 16198 | 0 17579 | 0 20615 | | | | | | | | | |
| 20 | 0 53000 | -0 01439 | -0 14865 | -57 766 | 0 09564 | 20 | -0 18697 | 0 04639 | -0 10830 | 0 09289 | | | | | | | | | |
| 21 | 0 56000 | 0 05223 | 0 25273 | -56 998 | 0 09717 | 21 | -0 12100 | -0 06570 | -0 04102 | 0 01687 | | | | | | | | | |
| 22 | 0 59000 | 0 11885 | -0 35398 | 56 333 | 0 09833 | 22 | -0 05484 | -0 17416 | 0 02606 | -0 12315 | | | | | | | | | |
| 23 | 0 62000 | 0 18547 | -0 45295 | -55 794 | 0 09913 | 23 | 0 01148 | -0 27919 | 0 09297 | -0 22627 | | | | | | | | | |
| 24 | 0 65000 | 0 25209 | -0 55015 | -55 370 | 0 09943 | 24 | 0 07793 | -0 38124 | 0 15977 | -0 32673 | | | | | | | | | |
| 25 | 0 68000 | 0 31871 | -0 64599 | -55 032 | 0 09901 | 25 | 0 14448 | -0 48082 | 0 22646 | -0 42509 | | | | | | | | | |
| 26 | 0 71000 | 0 38533 | -0 74074 | -54 745 | 0 09739 | 26 | 0 21118 | -0 57841 | 0 29300 | -0 52190 | | | | | | | | | |
| 27 | 0 74000 | 0 45195 | -0 83450 | -54 469 | 0 09419 | 27 | 0 27814 | -0 67436 | 0 35928 | -0 61762 | | | | | | | | | |
| 28 | 0 77000 | 0 51857 | -0 92732 | -54 187 | 0 08949 | 28 | 0 34557 | -0 76884 | 0 42510 | -0 71263 | | | | | | | | | |
| 29 | 0 80000 | 0 58519 | -1 01914 | -53 885 | 0 08347 | 29 | 0 41363 | -0 86187 | 0 49028 | -0 80714 | | | | | | | | | |
| 30 | 0 83000 | 0 65181 | -1 10990 | -53 546 | 0 07625 | 30 | 0 48229 | 0 95350 | 0 55486 | -0 90114 | | | | | | | | | |
| 31 | 0 86000 | 0 71843 | -1 19946 | -53 152 | 0 06794 | 31 | 0 55148 | -1 04374 | 0 61891 | -0 99454 | | | | | | | | | |
| 32 | 0 89000 | 0 78506 | 1 28762 | -52 678 | 0 05871 | 32 | 0 62115 | -1 13256 | 0 68248 | -1 08725 | | | | | | | | | |
| 33 | 0 92000 | 0 85168 | -1 37413 | -52 107 | 0 04873 | 33 | 0 69125 | -1 21983 | 0 74562 | -1 17909 | | | | | | | | | |
| 34 | 0 95000 | 0 91830 | 1 45874 | -51 446 | 0 03821 | 34 | 0 76171 | -1 30542 | 0 80840 | -1 26982 | | | | | | | | | |
| 35 | 0 97500 | 0 97381 | -1 52766 | -50 839 | 0 02915 | 35 | 0 83245 | -1 38910 | 0 87090 | -1 35917 | | | | | | | | | |
| 36 | 1 00000 | 1 02933 | 1 59506 | -50 196 | 0 01997 | 36 | 0 90336 | -1 47065 | 0 93324 | -1 44684 | | | | | | | | | |
| | | | | | | 37 | 0 96251 | 1 53696 | 0 99511 | -1 51846 | | | | | | | | | |
| | | | | | | 38 | 1 01487 | -1 59112 | 1 03103 | -1 58068 | | | | | | | | | |
| | | | | | | 39 | 1 02120 | -1 59740 | 1 03309 | -1 58770 | | | | | | | | | |
| | | | | | | 40 | 1 02933 | 1 59506 | 1 02933 | -1 59506 | | | | | | | | | |

CHORD 4 02455 CAMBER 3 429 STAGGER -56 510

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 4

| MEANLINE DATA | | | | | | SURFACE COORDINATES | | | | | |
|---------------|---------|----------|----------|---------|---------|---------------------|----------|----------|----------|----------|--|
| PT | PCT X | X | Y | B.M | T(M) | PT | XS | YS | XP | YP | |
| 1 | 0 | -1 27111 | 1 73523 | -52 305 | 0 02007 | 1 | -1 27111 | 1 73523 | -1 27111 | 1 73523 | |
| 2 | 0 02500 | -1 21143 | 1 65728 | -52 811 | 0 02541 | 2 | -1 27508 | 1 72801 | -1 26298 | 1 73721 | |
| 3 | 0 05000 | -1 15174 | 1 57790 | -53 307 | 0 03074 | 3 | -1 27314 | 1 72100 | -1 25682 | 1 73358 | |
| 4 | 0 07500 | -1 09206 | 1 49709 | -53 793 | 0 03603 | 4 | -1 22155 | 1 64960 | -1 20130 | 1 66496 | |
| 5 | 0 10000 | -1 03237 | 1 41485 | -54 271 | 0 04126 | 5 | -1 16407 | 1 56872 | -1 13942 | 1 58709 | |
| 6 | 0 12500 | -0 97269 | 1 33115 | -54 745 | 0 04642 | 6 | -1 10659 | 1 48645 | -1 07752 | 1 50774 | |
| 7 | 0 15000 | -0 91301 | 1 24596 | -55 222 | 0 05149 | 7 | -1 04912 | 1 40280 | -1 01563 | 1 42689 | |
| 8 | 0 17500 | -0 85332 | 1 15922 | -55 723 | 0 05644 | 8 | -0 99165 | 1 31775 | -0 95374 | 1 34454 | |
| 9 | 0 20000 | -0 79364 | 1 07077 | -56 259 | 0 06125 | 9 | -0 93415 | 1 23128 | -0 89186 | 1 26065 | |
| 10 | 0 23000 | -0 72202 | 0 96219 | -56 918 | 0 06683 | 10 | -0 87664 | 1 14333 | -0 83001 | 1 17511 | |
| 11 | 0 26000 | -0 65040 | 0 85091 | -57 537 | 0 07217 | 11 | -0 81911 | 1 05376 | -0 76817 | 1 08778 | |
| 12 | 0 29000 | -0 57878 | 0 73720 | -58 023 | 0 07724 | 12 | -0 75002 | 0 94395 | -0 69402 | 0 98044 | |
| 13 | 0 32000 | -0 50716 | 0 62179 | -58 290 | 0 08201 | 13 | -0 68085 | 0 83154 | -0 61995 | 0 87028 | |
| 14 | 0 35000 | -0 43554 | 0 50575 | -58 993 | 0 08645 | 14 | -0 61154 | 0 71674 | -0 54602 | 0 75765 | |
| 15 | 0 38000 | -0 36392 | 0 39038 | -57 995 | 0 09056 | 15 | -0 54204 | 0 60023 | -0 47228 | 0 64334 | |
| 16 | 0 41000 | -0 29230 | 0 27704 | -57 364 | 0 09429 | 16 | -0 47231 | 0 48304 | -0 39876 | 0 52847 | |
| 17 | 0 44000 | -0 22068 | 0 16715 | -56 401 | 0 09764 | 17 | -0 40231 | 0 36638 | -0 32552 | 0 41437 | |
| 18 | 0 47000 | -0 14906 | 0 06159 | -55 274 | 0 10060 | 18 | -0 33200 | 0 25162 | -0 25260 | 0 30247 | |
| 19 | 0 50000 | -0 07744 | -0 03969 | -54 210 | 0 10313 | 19 | -0 26134 | 0 14013 | -0 18001 | 0 19416 | |
| 20 | 0 53000 | -0 00582 | -0 13738 | -53 335 | 0 10522 | 20 | -0 19040 | 0 03293 | -0 10772 | 0 09024 | |
| 21 | 0 56000 | 0 06580 | -0 23245 | -52 720 | 0 10685 | 21 | -0 11927 | -0 06985 | -0 03561 | -0 00953 | |
| 22 | 0 59000 | 0 13742 | -0 32578 | -52 298 | 0 10808 | 22 | -0 04802 | -0 16880 | 0 03638 | -0 10597 | |
| 23 | 0 62000 | 0 20904 | -0 41788 | -51 971 | 0 10892 | 23 | 0 02329 | -0 26481 | 0 10831 | -0 20009 | |
| 24 | 0 65000 | 0 28066 | -0 50899 | -51 692 | 0 10911 | 24 | 0 09467 | -0 35883 | 0 18018 | -0 29274 | |
| 25 | 0 68000 | 0 35228 | -0 59923 | -51 430 | 0 10834 | 25 | 0 16615 | -0 45143 | 0 25194 | -0 38433 | |
| 26 | 0 71000 | 0 42390 | -0 68861 | -51 152 | 0 10621 | 26 | 0 23785 | -0 54281 | 0 32347 | -0 47517 | |
| 27 | 0 74000 | 0 49552 | 0 77704 | -50 839 | 0 10240 | 27 | 0 30993 | -0 63300 | 0 39464 | -0 56546 | |
| 28 | 0 77000 | 0 56714 | -0 86447 | -50 511 | 0 09703 | 28 | 0 38255 | -0 72191 | 0 46526 | -0 65530 | |
| 29 | 0 80000 | 0 63876 | -0 95090 | -50 194 | 0 09026 | 29 | 0 45582 | -0 80938 | 0 53522 | -0 74471 | |
| 30 | 0 83000 | 0 71038 | -1 03637 | -49 883 | 0 08223 | 30 | 0 52970 | -0 89532 | 0 60458 | -0 83362 | |
| 31 | 0 86000 | 0 78201 | -1 12089 | -49 561 | 0 07306 | 31 | 0 60409 | -0 97979 | 0 67344 | -0 92200 | |
| 32 | 0 89000 | 0 85363 | -1 20439 | -49 177 | 0 06292 | 32 | 0 67894 | -1 06286 | 0 74183 | -1 00987 | |
| 33 | 0 92000 | 0 92525 | -1 28660 | -48 681 | 0 05199 | 33 | 0 75420 | -1 14459 | 0 80981 | -1 09972 | |
| 34 | 0 95000 | 0 99687 | -1 36724 | -48 079 | 0 04049 | 34 | 0 82982 | -1 22495 | 0 87743 | -1 18382 | |
| 35 | 0 97500 | 1 05655 | -1 43306 | -47 515 | 0 03062 | 35 | 0 90572 | -1 30376 | 0 94477 | -1 26944 | |
| 36 | 1 00000 | 1 11623 | 1 49755 | -46 914 | 0 02062 | 36 | 0 98180 | -1 38076 | 1 01193 | -1 35371 | |
| | | | | | | 37 | 1 04526 | -1 44340 | 1 05784 | -1 42272 | |
| | | | | | | 38 | 1 10124 | -1 49747 | 1 11717 | -1 48260 | |
| | | | | | | 39 | 1 10799 | 1 50947 | 1 11969 | -1 48972 | |
| | | | | | | 40 | 1 11623 | -1 49755 | 1 11623 | -1 49755 | |

CHORD 4 01874 CAMBER 5 391 STAGGER 53 555

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 5

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | | | | | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|----------|----------|---------------------|--|--|--|--|--|--|--|--|--|
| PT | PCT X | X | Y | B*M | I(M) | PT | XS | YS | XP | YP | | | | | | | | | |
| 1 | 0 | -1.34730 | 1.69080 | -50.948 | 0.02036 | 1 | -1.34730 | 1.69080 | 1.34730 | 1.69080 | | | | | | | | | |
| 2 | 0.02500 | 1.28385 | 1.61195 | -51.401 | 0.02672 | 2 | -1.35116 | 1.68336 | -1.33909 | 1.69302 | | | | | | | | | |
| 3 | 0.05000 | -1.22040 | 1.53183 | -51.845 | 0.03305 | 3 | -1.34905 | 1.67629 | -1.33273 | 1.68950 | | | | | | | | | |
| 4 | 0.07500 | -1.15695 | 1.45044 | -52.280 | 0.03933 | 4 | -1.29429 | 1.60362 | -1.27341 | 1.62029 | | | | | | | | | |
| 5 | 0.10000 | -1.09350 | 1.36777 | -52.706 | 0.04555 | 5 | -1.23340 | 1.52162 | -1.20741 | 1.54204 | | | | | | | | | |
| 6 | 0.12500 | -1.03006 | 1.28383 | -53.123 | 0.05168 | 6 | -1.17251 | 1.43841 | -1.14140 | 1.46247 | | | | | | | | | |
| 7 | 0.15000 | -0.96661 | 1.19862 | -53.535 | 0.05769 | 7 | -1.11162 | 1.35397 | -1.07539 | 1.38157 | | | | | | | | | |
| 8 | 0.17500 | -0.90316 | 1.11210 | -53.956 | 0.06355 | 8 | -1.05073 | 1.26832 | -1.00939 | 1.29934 | | | | | | | | | |
| 9 | 0.20000 | -0.83971 | 1.02421 | -54.393 | 0.06926 | 9 | -0.98981 | 1.18147 | -0.94341 | 1.21576 | | | | | | | | | |
| 10 | 0.23000 | -0.76358 | 0.91687 | -54.902 | 0.07586 | 10 | -0.92886 | 1.09340 | -0.87747 | 1.13080 | | | | | | | | | |
| 11 | 0.26000 | -0.68744 | 0.80762 | -55.328 | 0.08216 | 11 | -0.86787 | 1.00405 | -0.81156 | 1.04437 | | | | | | | | | |
| 12 | 0.29000 | -0.61130 | 0.69699 | -55.558 | 0.08813 | 12 | -0.79461 | 0.89506 | -0.73254 | 0.93868 | | | | | | | | | |
| 13 | 0.32000 | -0.53517 | 0.58600 | -55.491 | 0.09373 | 13 | -0.72123 | 0.78426 | -0.65366 | 0.83099 | | | | | | | | | |
| 14 | 0.35000 | 0.45903 | 0.47590 | -55.130 | 0.09894 | 14 | -0.64764 | 0.67207 | -0.57496 | 0.72191 | | | | | | | | | |
| 15 | 0.38000 | -0.38289 | 0.36783 | -54.497 | 0.10373 | 15 | -0.57379 | 0.55945 | -0.49655 | 0.61255 | | | | | | | | | |
| 16 | 0.41000 | -0.30675 | 0.26272 | -53.633 | 0.10807 | 16 | -0.49962 | 0.44762 | -0.41844 | 0.50419 | | | | | | | | | |
| 17 | 0.44000 | -0.23062 | 0.16121 | -52.597 | 0.11193 | 17 | -0.42512 | 0.33771 | -0.34067 | 0.39795 | | | | | | | | | |
| 18 | 0.47000 | -0.15448 | 0.06355 | -51.526 | 0.11530 | 18 | -0.35027 | 0.23067 | -0.26324 | 0.29476 | | | | | | | | | |
| 19 | 0.50000 | -0.07834 | -0.03060 | -50.577 | 0.11818 | 19 | -0.27508 | 0.12722 | -0.18616 | 0.19521 | | | | | | | | | |
| 20 | 0.53000 | -0.00221 | -0.12194 | -49.829 | 0.12052 | 20 | -0.19962 | 0.02768 | 0.09335 | 0.09942 | | | | | | | | | |
| 21 | 0.56000 | 0.07393 | -0.21125 | -49.308 | 0.12228 | 21 | 0.12399 | 0.06813 | -0.03270 | 0.00692 | | | | | | | | | |
| 22 | 0.59000 | 0.15007 | -0.29917 | -48.924 | 0.12358 | 22 | -0.04825 | -0.16081 | 0.04384 | -0.08306 | | | | | | | | | |
| 23 | 0.62000 | 0.22620 | -0.38598 | -48.570 | 0.12442 | 23 | 0.02757 | -0.25111 | 0.12029 | -0.17138 | | | | | | | | | |
| 24 | 0.65000 | 0.30234 | 0.47172 | -48.222 | 0.12438 | 24 | 0.10349 | -0.33977 | 0.19665 | -0.25857 | | | | | | | | | |
| 25 | 0.68000 | 0.37848 | -0.55614 | -47.883 | 0.12297 | 25 | 0.17956 | -0.42715 | 0.27285 | -0.34481 | | | | | | | | | |
| 26 | 0.71000 | 0.45462 | -0.64016 | -47.558 | 0.11992 | 26 | 0.25596 | -0.51316 | 0.34872 | -0.43023 | | | | | | | | | |
| 27 | 0.74000 | 0.53075 | -0.72297 | -47.249 | 0.11510 | 27 | 0.33287 | -0.59767 | 0.42409 | -0.51520 | | | | | | | | | |
| 28 | 0.77000 | 0.60689 | 0.80489 | -46.941 | 0.10861 | 28 | 0.41037 | -0.68063 | 0.49887 | -0.59970 | | | | | | | | | |
| 29 | 0.80000 | 0.68303 | -0.88591 | -46.615 | 0.10062 | 29 | 0.48849 | -0.76204 | 0.57301 | -0.68390 | | | | | | | | | |
| 30 | 0.83000 | 0.75916 | -0.96598 | -46.261 | 0.09125 | 30 | 0.56721 | -0.84197 | 0.64657 | -0.76781 | | | | | | | | | |
| 31 | 0.86000 | 0.83530 | -1.04502 | -45.873 | 0.08065 | 31 | 0.64646 | -0.92047 | 0.71959 | -0.85136 | | | | | | | | | |
| 32 | 0.89000 | 0.91144 | -1.12294 | -45.452 | 0.06901 | 32 | 0.72620 | -0.99753 | 0.79213 | -0.93444 | | | | | | | | | |
| 33 | 0.92000 | 0.98758 | -1.19969 | -45.001 | 0.05654 | 33 | 0.80636 | -1.07309 | 0.86425 | -1.01694 | | | | | | | | | |
| 34 | 0.95000 | 1.06371 | -1.27521 | -44.524 | 0.04346 | 34 | 0.88658 | -1.14715 | 0.93603 | -1.09874 | | | | | | | | | |
| 35 | 0.97500 | 1.12716 | 1.33716 | -44.110 | 0.03224 | 35 | 0.96758 | -1.21968 | 1.00757 | -1.17970 | | | | | | | | | |
| 36 | 1.00000 | 1.19061 | -1.39822 | -43.686 | 0.02087 | 36 | 1.04848 | -1.29070 | 1.07895 | -1.25971 | | | | | | | | | |
| | | | | | | 37 | 1.11594 | -1.34873 | 1.13838 | -1.32559 | | | | | | | | | |
| | | | | | | 38 | 1.17540 | -1.39905 | 1.19076 | -1.38300 | | | | | | | | | |
| | | | | | | 39 | 1.18245 | -1.40166 | 1.19368 | -1.39005 | | | | | | | | | |
| | | | | | | 40 | 1.19061 | -1.39822 | 1.19061 | -1.39822 | | | | | | | | | |

CHORD 3.99787 CAMPER 7.262 STAGGER -50.594

PHASE III ROTOR

NR 20

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 6

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|----------|----------|---------------------|--|--|--|
| PT | PCT X | X | Y | B-M | T(M) | PT | XS | YS | XP | YP | | | |
| 1 | 0 | -1.41947 | 1.62753 | -49.775 | 0.02052 | 1 | -1.41947 | 1.62753 | -1.41947 | 1.62753 | | | |
| 2 | 0.02500 | -1.35251 | 1.54776 | 50.208 | 0.02856 | 2 | -1.42324 | 1.61994 | -1.41123 | 1.62997 | | | |
| 3 | 0.05000 | -1.28555 | 1.46676 | -50.631 | 0.03654 | 3 | -1.42100 | 1.61283 | 1.40471 | 1.62658 | | | |
| 4 | 0.07500 | -1.21860 | 1.38455 | -51.043 | 0.04447 | 4 | -1.36348 | 1.53862 | 1.34154 | 1.55689 | | | |
| 5 | 0.10000 | -1.15164 | 1.30113 | -51.444 | 0.05230 | 5 | -1.29968 | 1.45517 | -1.27143 | 1.47835 | | | |
| 6 | 0.12500 | -1.08468 | 1.21654 | -51.828 | 0.06002 | 6 | -1.23588 | 1.37057 | -1.20131 | 1.39853 | | | |
| 7 | 0.15000 | -1.01772 | 1.13080 | -52.194 | 0.06758 | 7 | -1.17209 | 1.28483 | -1.13119 | 1.31743 | | | |
| 8 | 0.17500 | -0.95076 | 1.04394 | -52.546 | 0.07495 | 8 | -1.10827 | 1.19793 | -1.06109 | 1.23509 | | | |
| 9 | 0.20000 | -0.88380 | 0.95599 | -52.879 | 0.08211 | 9 | -1.04442 | 1.11008 | -0.99102 | 1.15151 | | | |
| 10 | 0.23000 | -0.80345 | 0.84916 | -53.210 | 0.09038 | 10 | -0.98051 | 1.02115 | -0.92101 | 1.06673 | | | |
| 11 | 0.26000 | -0.72310 | 0.74130 | -53.381 | 0.09825 | 11 | -0.91654 | 0.93122 | -0.85107 | 0.98077 | | | |
| 12 | 0.29000 | -0.64275 | 0.63334 | -53.234 | 0.10568 | 12 | -0.83964 | 0.82209 | -0.76726 | 0.87622 | | | |
| 13 | 0.32000 | -0.56240 | 0.52682 | -52.635 | 0.11263 | 13 | -0.76253 | 0.71200 | -0.68367 | 0.77060 | | | |
| 14 | 0.35000 | -0.48205 | 0.42331 | -51.673 | 0.11906 | 14 | -0.68508 | 0.60171 | -0.60042 | 0.66496 | | | |
| 15 | 0.38000 | -0.40170 | 0.32372 | -50.511 | 0.12493 | 15 | -0.60716 | 0.49264 | -0.51764 | 0.56100 | | | |
| 16 | 0.41000 | -0.32135 | 0.22821 | -49.354 | 0.13022 | 16 | -0.52875 | 0.38639 | -0.43535 | 0.46022 | | | |
| 17 | 0.44000 | -0.24100 | 0.13624 | -48.398 | 0.13489 | 17 | -0.44991 | 0.28399 | -0.35349 | 0.36344 | | | |
| 18 | 0.47000 | -0.16065 | 0.04698 | -47.639 | 0.13891 | 18 | -0.37075 | 0.18580 | -0.27195 | 0.27062 | | | |
| 19 | 0.50000 | -0.08030 | -0.04014 | -47.013 | 0.14228 | 19 | -0.29143 | 0.09146 | -0.19057 | 0.18102 | | | |
| 20 | 0.53000 | 0.00005 | -0.12553 | -46.485 | 0.14495 | 20 | 0.21197 | 0.00018 | -0.10933 | 0.09377 | | | |
| 21 | 0.56000 | 0.08040 | -0.20948 | -46.027 | 0.14689 | 21 | -0.13234 | -0.08865 | -0.02826 | 0.00836 | | | |
| 22 | 0.59000 | 0.16075 | -0.29215 | -45.608 | 0.14821 | 22 | -0.05251 | -0.17544 | 0.05261 | -0.07563 | | | |
| 23 | 0.62000 | 0.24110 | -0.37364 | -45.202 | 0.14886 | 23 | 0.02755 | -0.26047 | 0.13326 | -0.15848 | | | |
| 24 | 0.65000 | 0.32145 | -0.45400 | -44.802 | 0.14825 | 24 | 0.10780 | -0.34399 | 0.21371 | -0.24031 | | | |
| 25 | 0.68000 | 0.40180 | -0.53325 | -44.408 | 0.14573 | 25 | 0.18829 | -0.42609 | 0.29392 | -0.32120 | | | |
| 26 | 0.71000 | 0.48216 | -0.61142 | -44.021 | 0.14123 | 26 | 0.26922 | -0.50659 | 0.37369 | -0.40140 | | | |
| 27 | 0.74000 | 0.56251 | -0.68856 | -43.642 | 0.13479 | 27 | 0.35081 | -0.58530 | 0.45279 | -0.48119 | | | |
| 28 | 0.77000 | 0.64286 | -0.76458 | -43.258 | 0.12654 | 28 | 0.43308 | -0.66220 | 0.53123 | -0.56065 | | | |
| 29 | 0.80000 | 0.72321 | -0.83977 | -42.857 | 0.11658 | 29 | 0.51599 | -0.73733 | 0.60902 | -0.63979 | | | |
| 30 | 0.83000 | 0.80356 | -0.91378 | -42.436 | 0.10509 | 30 | 0.59950 | -0.81076 | 0.68621 | -0.71860 | | | |
| 31 | 0.86000 | 0.88391 | -0.98668 | -41.996 | 0.09226 | 31 | 0.68356 | -0.88249 | 0.76285 | -0.79704 | | | |
| 32 | 0.89000 | 0.96426 | -1.05845 | -41.549 | 0.07829 | 32 | 0.76810 | -0.95256 | 0.83901 | -0.87500 | | | |
| 33 | 0.92000 | 1.04461 | -1.12911 | -41.104 | 0.06340 | 33 | 0.85304 | -1.02037 | 0.91477 | -0.95240 | | | |
| 34 | 0.95000 | 1.12496 | -1.19867 | -40.664 | 0.04782 | 34 | 0.93829 | -1.08775 | 0.99022 | -1.02916 | | | |
| 35 | 0.97500 | 1.19192 | -1.25582 | -40.297 | 0.03451 | 35 | 1.02377 | -1.15299 | 1.06545 | -1.10522 | | | |
| 36 | 1.00000 | 1.25888 | -1.31223 | -39.929 | 0.02105 | 36 | 1.10938 | -1.21681 | 1.14054 | -1.18053 | | | |
| | | | | | | 37 | 1.18076 | -1.26898 | 1.20308 | -1.24266 | | | |
| | | | | | | 38 | 1.24355 | -1.31418 | 1.25811 | -1.29682 | | | |
| | | | | | | 39 | 1.25087 | -1.31628 | 1.26147 | -1.30377 | | | |
| | | | | | | 40 | 1.25888 | -1.31223 | 1.25888 | -1.31223 | | | |

CHORD 3.97691 CAMBER 9.846 STAGGER -47.664

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 7

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | | | | | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|----------|----------|---------------------|--|--|--|--|--|--|--|--|--|
| PT | PCT X | X | Y | B.M | T(M) | PT | XS | YS | XP | YP | | | | | | | | | |
| 1 | 0. | -1 49130 | 1 54450 | -48.731 | 0.02021 | 1 | -1 49130 | 1 54450 | -1 49130 | 1 54450 | | | | | | | | | |
| 2 | 0 02500 | -1 42094 | 1 46373 | -49 149 | 0 03057 | 2 | -1 49491 | 1 53692 | -1 48320 | 1 54707 | | | | | | | | | |
| 3 | 0 05000 | -1 35059 | 1 38178 | -49 545 | 0 04089 | 3 | -1 43262 | 1 52992 | -1 47668 | 1 54389 | | | | | | | | | |
| 4 | 0 07500 | -1 28023 | 1 29874 | -49 905 | 0 05113 | 4 | -1 43251 | 1 45373 | -1 40938 | 1 47372 | | | | | | | | | |
| 5 | 0 10000 | -1 20987 | 1 21470 | -50 214 | 0 06125 | 5 | -1 36614 | 1 36852 | 1 33503 | 1 39505 | | | | | | | | | |
| 6 | 0 12500 | -1 13952 | 1 12982 | -50 463 | 0 07120 | 6 | -1 29979 | 1 28227 | -1 26067 | 1 31520 | | | | | | | | | |
| 7 | 0 15000 | -1 06916 | 1 04429 | -50 643 | 0 08094 | 7 | -1 23341 | 1 19510 | -1 18634 | 1 23429 | | | | | | | | | |
| 8 | 0 17500 | -0 99880 | 0 95832 | -50 748 | 0 09042 | 8 | -1 16697 | 1 10715 | -1 11206 | 1 15248 | | | | | | | | | |
| 9 | 0 20000 | -0 92845 | 0 87215 | -50 773 | 0 09961 | 9 | -1 10045 | 1 01862 | -1 03787 | 1 06995 | | | | | | | | | |
| 10 | 0 23000 | -0 84402 | 0 76886 | -50 677 | 0 11022 | 10 | -1 03381 | 0 92972 | -0 96379 | 0 98693 | | | | | | | | | |
| 11 | 0 26000 | -0 75959 | 0 66623 | -50 409 | 0 12029 | 11 | -0 96703 | 0 84066 | -0 88986 | 0 90765 | | | | | | | | | |
| 12 | 0 29000 | -0 67516 | 0 56497 | -49 901 | 0 12977 | 12 | -0 88665 | 0 73394 | -0 80139 | 0 80379 | | | | | | | | | |
| 13 | 0 32000 | -0 59073 | 0 46603 | -49 099 | 0 13858 | 13 | -0 80594 | 0 62790 | -0 71324 | 0 70456 | | | | | | | | | |
| 14 | 0 35000 | -0 50630 | 0 37026 | -48 069 | 0 14670 | 14 | -0 72479 | 0 52318 | -0 62553 | 0 60676 | | | | | | | | | |
| 15 | 0 38000 | -0 42188 | 0 27812 | -46 921 | 0 15408 | 15 | -0 64311 | 0 42066 | -0 53836 | 0 51140 | | | | | | | | | |
| 16 | 0 41000 | -0 33745 | 0 18962 | -45 790 | 0 16067 | 16 | -0 56087 | 0 32125 | -0 45173 | 0 41928 | | | | | | | | | |
| 17 | 0 44000 | -0 25302 | 0 10434 | -44 804 | 0 16645 | 17 | -0 47815 | 0 22550 | -0 36560 | 0 33074 | | | | | | | | | |
| 18 | 0 47000 | -0 16859 | 0 02174 | -43 964 | 0 17137 | 18 | -0 39503 | 0 13360 | -0 27986 | 0 24563 | | | | | | | | | |
| 19 | 0 50000 | -0 08416 | -0 05864 | -43 235 | 0 17541 | 19 | -0 31166 | 0 04530 | -0 19437 | 0 16339 | | | | | | | | | |
| 20 | 0 53000 | 0 00027 | -0 13712 | -42 596 | 0 17854 | 20 | -0 22807 | -0 03993 | 0 10911 | 0 08341 | | | | | | | | | |
| 21 | 0 56000 | 0 08470 | -0 21397 | -42 032 | 0 18073 | 21 | -0 14424 | -0 12254 | -0 02409 | 0 00526 | | | | | | | | | |
| 22 | 0 59000 | 0 16912 | -0 28939 | -41 525 | 0 18199 | 22 | 0 06015 | -0 20283 | 0 06069 | -0 07141 | | | | | | | | | |
| 23 | 0 62000 | 0 25355 | -0 36353 | -41 059 | 0 18222 | 23 | 0 02419 | -0 28109 | 0 14520 | -0 14685 | | | | | | | | | |
| 24 | 0 65000 | 0 33798 | -0 43651 | -40 619 | 0 18070 | 24 | 0 10880 | -0 35751 | 0 22945 | -0 22126 | | | | | | | | | |
| 25 | 0 68000 | 0 42241 | -0 50838 | -40 195 | 0 17676 | 25 | 0 19371 | -0 43223 | 0 31339 | 0 29483 | | | | | | | | | |
| 26 | 0 71000 | 0 50684 | -0 57919 | -39 778 | 0 17041 | 26 | 0 27916 | -0 50509 | 0 39680 | -0 36793 | | | | | | | | | |
| 27 | 0 74000 | 0 59127 | -0 64895 | -39 359 | 0 16186 | 27 | 0 36537 | -0 57588 | 0 47945 | -0 44087 | | | | | | | | | |
| 28 | 0 77000 | 0 67569 | -0 71769 | -38 939 | 0 15122 | 28 | 0 45232 | -0 61467 | 0 56135 | -0 51370 | | | | | | | | | |
| 29 | 0 80000 | 0 76012 | -0 78540 | -38 518 | 0 13860 | 29 | 0 53994 | -0 71153 | 0 64259 | -0 58638 | | | | | | | | | |
| 30 | 0 83000 | 0 84455 | -0 85209 | -38 096 | 0 12422 | 30 | 0 62817 | -0 77650 | 0 72321 | -0 65888 | | | | | | | | | |
| 31 | 0 86000 | 0 92898 | -0 91778 | -37 670 | 0 10832 | 31 | 0 71696 | -0 83962 | 0 80328 | 0 73118 | | | | | | | | | |
| 32 | 0 89000 | 1 01341 | -0 98246 | -37 237 | 0 09111 | 32 | 0 80523 | -0 90097 | 0 88287 | 0 80321 | | | | | | | | | |
| 33 | 0 92000 | 1 09784 | -1 04612 | -36 791 | 0 07284 | 33 | 0 89588 | -0 96065 | 0 96208 | -0 87491 | | | | | | | | | |
| 34 | 0 95000 | 1 18226 | -1 10874 | -36 334 | 0 05379 | 34 | 0 98584 | -1 01873 | 1 04097 | -0 94619 | | | | | | | | | |
| 35 | 0 97500 | 1 25262 | 1 16012 | -35 944 | 0 03755 | 35 | 1 07602 | -1 07528 | 1 11965 | -1 01695 | | | | | | | | | |
| 36 | 1 00000 | 1 32298 | 1 21076 | -35 549 | 0 02115 | 36 | 1 16633 | -1 13040 | 1 19820 | -1 08707 | | | | | | | | | |
| | | | | | | 37 | 1 24160 | -1 17532 | 1 26364 | -1 14491 | | | | | | | | | |
| | | | | | | 38 | 1 30768 | 1 21405 | 1 32115 | -1 19523 | | | | | | | | | |
| | | | | | | 39 | 1 31521 | -1 21550 | 1 32497 | 1 20202 | | | | | | | | | |
| | | | | | | 40 | 1 32298 | -1 21076 | 1 32298 | 1 21076 | | | | | | | | | |

C110RD 3 93848 CAMBER 13.183 STAGGER -44 393

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 8

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | | | | | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|-----------|----------|---------------------|--|--|--|--|--|--|--|--|--|
| PT | PC1 X | X | Y | B-M | T (M) | PT | XS | YS | XP | YP | | | | | | | | | |
| 1 | 0. | 1.56132 | 1.44158 | -47.655 | 0.01929 | 1 | 1.56132 | 1.44158 | -1.56132 | 1.44158 | | | | | | | | | |
| 2 | 0.02500 | -1.48763 | 1.36041 | -47.916 | 0.03220 | 2 | -1.56466 | 1.43423 | -1.55362 | 1.44421 | | | | | | | | | |
| 3 | 0.05000 | 1.41406 | 1.27854 | -48.150 | 0.04506 | 3 | -1.56238 | 1.42758 | -1.54728 | 1.44134 | | | | | | | | | |
| 4 | 0.07500 | 1.34043 | 1.19605 | -48.333 | 0.05782 | 4 | -1.49964 | 1.34962 | -1.47574 | 1.37120 | | | | | | | | | |
| 5 | 0.10000 | 1.26681 | 1.11314 | -48.443 | 0.07041 | 5 | -1.43085 | 1.26350 | -1.39728 | 1.29357 | | | | | | | | | |
| 6 | 0.12500 | -1.19318 | 1.03003 | -48.464 | 0.08279 | 6 | -1.36203 | 1.17683 | -1.31884 | 1.21527 | | | | | | | | | |
| 7 | 0.15000 | -1.11955 | 0.94701 | -48.385 | 0.09488 | 7 | -1.29315 | 1.08978 | -1.24046 | 1.13649 | | | | | | | | | |
| 8 | 0.17500 | -1.04592 | 0.86436 | -48.203 | 0.10664 | 8 | -1.22416 | 1.00259 | -1.16219 | 1.05748 | | | | | | | | | |
| 9 | 0.20000 | -0.97229 | 0.78240 | -47.913 | 0.11803 | 9 | -1.15502 | 0.91550 | -1.08408 | 0.97851 | | | | | | | | | |
| 10 | 0.23000 | -0.88394 | 0.68537 | -47.414 | 0.13112 | 10 | -1.08567 | 0.82892 | -1.00617 | 0.89990 | | | | | | | | | |
| 11 | 0.26000 | -0.79559 | 0.59032 | -46.736 | 0.14350 | 11 | -1.01609 | 0.74284 | -0.92850 | 0.82195 | | | | | | | | | |
| 12 | 0.29000 | -0.70723 | 0.49782 | -45.848 | 0.15511 | 12 | -0.93221 | 0.64101 | -0.83567 | 0.72974 | | | | | | | | | |
| 13 | 0.32000 | -0.61898 | 0.40851 | -44.731 | 0.16588 | 13 | -0.84788 | 0.54114 | -0.74334 | 0.63949 | | | | | | | | | |
| 14 | 0.35000 | -0.53053 | 0.32287 | -43.466 | 0.17574 | 14 | -0.76288 | 0.44380 | -0.65159 | 0.55184 | | | | | | | | | |
| 15 | 0.38000 | -0.44217 | 0.24100 | -42.175 | 0.18463 | 15 | -0.67725 | 0.34959 | -0.56051 | 0.46743 | | | | | | | | | |
| 16 | 0.41000 | -0.35382 | 0.16263 | -40.996 | 0.19252 | 16 | -0.59098 | 0.25909 | -0.47008 | 0.38664 | | | | | | | | | |
| 17 | 0.44000 | -0.26547 | 0.08716 | -40.044 | 0.19937 | 17 | -0.50416 | 0.17258 | -0.38019 | 0.30941 | | | | | | | | | |
| 18 | 0.47000 | -0.17711 | 0.01394 | -39.281 | 0.20510 | 18 | -0.41697 | 0.08997 | -0.29067 | 0.23528 | | | | | | | | | |
| 19 | 0.50000 | -0.08876 | -0.05747 | -38.624 | 0.20968 | 19 | -0.32960 | 0.01085 | -0.20133 | 0.16348 | | | | | | | | | |
| 20 | 0.53000 | -0.00041 | -0.12731 | -38.027 | 0.21312 | 20 | -0.24204 | -0.06544 | -0.11219 | 0.09332 | | | | | | | | | |
| 21 | 0.56000 | 0.08795 | -0.19569 | -37.457 | 0.21543 | 21 | -0.15420 | -0.13938 | -0.02332 | 0.02443 | | | | | | | | | |
| 22 | 0.59000 | 0.17630 | -0.26271 | -36.905 | 0.21642 | 22 | -0.06605 | -0.21125 | 0.06524 | -0.04337 | | | | | | | | | |
| 23 | 0.62000 | 0.26465 | -0.32841 | -36.369 | 0.21580 | 23 | 0.02244 | -0.28120 | 0.15345 | -0.11019 | | | | | | | | | |
| 24 | 0.65000 | 0.35301 | -0.39285 | -35.844 | 0.21293 | 24 | 0.11132 | -0.34924 | 0.24128 | -0.17618 | | | | | | | | | |
| 25 | 0.68000 | 0.44136 | -0.45608 | -35.329 | 0.20725 | 25 | 0.20067 | -0.41529 | 0.32863 | -0.24153 | | | | | | | | | |
| 26 | 0.71000 | 0.52971 | -0.51812 | -34.824 | 0.19887 | 26 | 0.29066 | -0.47916 | 0.41535 | -0.30655 | | | | | | | | | |
| 27 | 0.74000 | 0.61807 | -0.57901 | -34.327 | 0.18804 | 27 | 0.38144 | -0.54062 | 0.50128 | -0.37153 | | | | | | | | | |
| 28 | 0.77000 | 0.70642 | -0.63879 | -33.832 | 0.17491 | 28 | 0.47293 | -0.59974 | 0.58650 | -0.43649 | | | | | | | | | |
| 29 | 0.80000 | 0.79477 | -0.69744 | -33.327 | 0.15961 | 29 | 0.56505 | -0.65666 | 0.67109 | -0.50137 | | | | | | | | | |
| 30 | 0.83000 | 0.88313 | -0.75498 | -32.813 | 0.14238 | 30 | 0.65773 | -0.71143 | 0.75511 | -0.56614 | | | | | | | | | |
| 31 | 0.86000 | 0.97148 | -0.81138 | -32.292 | 0.12347 | 31 | 0.75092 | -0.76413 | 0.83862 | -0.63076 | | | | | | | | | |
| 32 | 0.89000 | 1.05983 | -0.86666 | -31.772 | 0.10314 | 32 | 0.84455 | -0.81481 | 0.92170 | -0.69515 | | | | | | | | | |
| 33 | 0.92000 | 1.14819 | -0.92084 | -31.263 | 0.08165 | 33 | 0.93850 | -0.86357 | 1.00446 | -0.75920 | | | | | | | | | |
| 34 | 0.95000 | 1.23654 | -0.97395 | -30.763 | 0.05934 | 34 | 1.03268 | -0.91050 | 1.08699 | -0.82282 | | | | | | | | | |
| 35 | 0.97500 | 1.31017 | -1.01742 | -30.349 | 0.04034 | 35 | 1.12700 | -0.99945 | 1.16937 | -0.88594 | | | | | | | | | |
| 36 | 1.00000 | 1.38380 | -1.06017 | -29.936 | 0.02117 | 36 | 1.22136 | -0.99574 | 1.25171 | -0.94846 | | | | | | | | | |
| | | | | | | 37 | 1.29998 | -1.03483 | 1.32036 | -1.00001 | | | | | | | | | |
| | | | | | | 38 | 1.36880 | -1.06512 | 1.38057 | -1.04473 | | | | | | | | | |
| | | | | | | 39 | 1.43649 | -1.09573 | 1.43498 | -1.08121 | | | | | | | | | |
| | | | | | | 40 | 1.50380 | -1.126017 | 1.48380 | -1.116017 | | | | | | | | | |

CHORD 3.86425 CAMBER 17.720 STAGGER 40.347

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 9

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | | | | | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|----------|----------|---------------------|--|--|--|--|--|--|--|--|--|
| PT | PCT X | X | Y | R+M | T(M) | PT | XS | YS | XP | YP | | | | | | | | | |
| 1 | 0 | -1.61594 | 1.30460 | -46.328 | 0.01883 | 1 | -1.61594 | 1.30460 | 1.61594 | 1.30460 | | | | | | | | | |
| 2 | 0.02500 | -1.53918 | 1.22427 | -46.271 | 0.03432 | 2 | -1.61906 | 1.29728 | -1.60850 | 1.30738 | | | | | | | | | |
| 3 | 0.05000 | -1.46242 | 1.14412 | -46.197 | 0.04975 | 3 | -1.61674 | 1.29085 | -1.60217 | 1.30476 | | | | | | | | | |
| 4 | 0.07500 | -1.38566 | 1.06422 | -46.093 | 0.06504 | 4 | -1.55158 | 1.21241 | -1.52678 | 1.23613 | | | | | | | | | |
| 5 | 0.10000 | -1.30889 | 0.98467 | -45.943 | 0.08011 | 5 | -1.48037 | 1.12690 | -1.44446 | 1.16134 | | | | | | | | | |
| 6 | 0.12500 | -1.23213 | 0.90562 | -45.725 | 0.09489 | 6 | -1.40909 | 1.04167 | -1.36222 | 1.08678 | | | | | | | | | |
| 7 | 0.15000 | -1.15537 | 0.82730 | -45.411 | 0.10932 | 7 | -1.33768 | 0.95682 | -1.28011 | 1.01253 | | | | | | | | | |
| 8 | 0.17500 | -1.07861 | 0.75002 | -44.946 | 0.12333 | 8 | -1.26611 | 0.87250 | 1.19816 | 0.93875 | | | | | | | | | |
| 9 | 0.20000 | -1.00185 | 0.67424 | -44.277 | 0.13686 | 9 | -1.19430 | 0.78892 | -1.11644 | 0.86567 | | | | | | | | | |
| 10 | 0.23000 | -0.90974 | 0.58601 | -43.207 | 0.15236 | 10 | -1.12217 | 0.70637 | -1.03505 | 0.79366 | | | | | | | | | |
| 11 | 0.26000 | -0.81762 | 0.50141 | -41.889 | 0.16697 | 11 | -1.04962 | 0.62525 | -0.95408 | 0.72323 | | | | | | | | | |
| 12 | 0.29000 | -0.72551 | 0.42080 | -40.489 | 0.18060 | 12 | -0.96189 | 0.53048 | -0.85758 | 0.64154 | | | | | | | | | |
| 13 | 0.32000 | -0.63340 | 0.34397 | -39.195 | 0.19319 | 13 | -0.87336 | 0.43926 | -0.76188 | 0.56356 | | | | | | | | | |
| 14 | 0.35000 | -0.54128 | 0.27041 | -38.046 | 0.20467 | 14 | -0.78414 | 0.35212 | -0.66688 | 0.48947 | | | | | | | | | |
| 15 | 0.38000 | -0.44917 | 0.19965 | -37.031 | 0.21494 | 15 | -0.69444 | 0.26910 | -0.57235 | 0.41883 | | | | | | | | | |
| 16 | 0.41000 | -0.35706 | 0.13133 | -36.107 | 0.22395 | 16 | -0.60435 | 0.18982 | 0.47822 | 0.35100 | | | | | | | | | |
| 17 | 0.44000 | -0.26494 | 0.06522 | -35.230 | 0.23165 | 17 | -0.51389 | 0.11385 | -0.38445 | 0.28544 | | | | | | | | | |
| 18 | 0.47000 | -0.17283 | 0.00119 | -34.383 | 0.23796 | 18 | -0.42304 | 0.04086 | 0.29107 | 0.22180 | | | | | | | | | |
| 19 | 0.50000 | -0.08072 | -0.06088 | -33.561 | 0.24283 | 19 | -0.33176 | -0.02939 | -0.19813 | 0.15983 | | | | | | | | | |
| 20 | 0.53000 | 0.01140 | -0.12106 | -32.761 | 0.24634 | 20 | -0.24002 | -0.09701 | -0.10564 | 0.09938 | | | | | | | | | |
| 21 | 0.56000 | 0.10351 | 0.17945 | -31.986 | 0.24850 | 21 | -0.14784 | -0.16205 | -0.01360 | 0.04030 | | | | | | | | | |
| 22 | 0.59000 | 0.19562 | -0.23616 | -31.255 | 0.24888 | 22 | -0.05526 | -0.22464 | 0.07805 | -0.01748 | | | | | | | | | |
| 23 | 0.62000 | 0.28774 | -0.29132 | -30.585 | 0.24693 | 23 | 0.07769 | -0.28484 | 0.16933 | -0.07407 | | | | | | | | | |
| 24 | 0.65000 | 0.37985 | -0.34509 | -29.967 | 0.24228 | 24 | 0.13106 | -0.32454 | 0.26019 | -0.12978 | | | | | | | | | |
| 25 | 0.68000 | 0.47196 | -0.39757 | -29.384 | 0.23466 | 25 | 0.22492 | -0.39761 | 0.35056 | -0.18503 | | | | | | | | | |
| 26 | 0.71000 | 0.56408 | -0.44884 | -28.817 | 0.22420 | 26 | 0.31934 | -0.45003 | 0.44036 | -0.24014 | | | | | | | | | |
| 27 | 0.74000 | 0.65619 | -0.49892 | -28.247 | 0.21112 | 27 | 0.41439 | -0.49981 | 0.52953 | -0.29534 | | | | | | | | | |
| 28 | 0.77000 | 0.74830 | -0.54782 | -27.675 | 0.19560 | 28 | 0.51004 | -0.54706 | 0.61811 | -0.35062 | | | | | | | | | |
| 29 | 0.80000 | 0.84042 | -0.59554 | -27.100 | 0.17780 | 29 | 0.60623 | -0.59191 | 0.70615 | -0.40593 | | | | | | | | | |
| 30 | 0.83000 | 0.93253 | -0.64210 | -26.524 | 0.15797 | 30 | 0.70288 | -0.63443 | 0.79773 | -0.46121 | | | | | | | | | |
| 31 | 0.86000 | 1.02464 | -0.68749 | -25.941 | 0.13639 | 31 | 0.79992 | -0.67468 | 0.88091 | -0.51641 | | | | | | | | | |
| 32 | 0.89000 | 1.11676 | -0.73172 | -25.348 | 0.11333 | 32 | 0.89726 | -0.71277 | 0.96780 | -0.57143 | | | | | | | | | |
| 33 | 0.92000 | 1.20887 | -0.77476 | -24.737 | 0.08908 | 33 | 0.99481 | -0.74881 | 1.05448 | -0.62617 | | | | | | | | | |
| 34 | 0.95000 | 1.30098 | -0.81659 | -24.109 | 0.06397 | 34 | 1.09250 | -0.78292 | 1.14101 | -0.68051 | | | | | | | | | |
| 35 | 0.97500 | 1.37774 | -0.85051 | -23.574 | 0.04263 | 35 | 1.19023 | -0.81521 | 1.22751 | -0.73430 | | | | | | | | | |
| 36 | 1.00000 | 1.45451 | -0.88358 | -23.030 | 0.02111 | 36 | 1.28792 | -0.84578 | 1.31405 | -0.78739 | | | | | | | | | |
| | | | | | | 37 | 1.36922 | -0.87005 | 1.38627 | -0.83097 | | | | | | | | | |
| | | | | | | 38 | 1.44020 | -0.89043 | 1.44955 | -0.86852 | | | | | | | | | |
| | | | | | | 39 | 1.44789 | -0.89003 | 1.45465 | -0.87451 | | | | | | | | | |
| | | | | | | 40 | 1.45451 | 0.88358 | 1.45451 | 0.88358 | | | | | | | | | |

CHORD 3.77037 CAMBER 23.298 STAGGER 35.476

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY - STPEAMI INF 10

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|----------|----------|---------------------|--|--|--|
| PT | PCT X | X | Y | B-M | T(M) | PI | XS | YS | XP | YP | | | |
| 1 | 0 | -1.61706 | 1.12360 | -44.267 | 0.02119 | 1 | -1.61706 | 1.12360 | -1.61706 | 1.12360 | | | |
| 2 | 0.02500 | -1.53770 | 1.04648 | -44.092 | 0.03909 | 2 | -1.62031 | 1.11518 | -1.60880 | 1.12707 | | | |
| 3 | 0.05000 | -1.45834 | 0.96988 | -43.870 | 0.05690 | 3 | -1.61748 | 1.10303 | -1.60151 | 1.12443 | | | |
| 4 | 0.07500 | -1.37899 | 0.89399 | -43.548 | 0.07453 | 4 | -1.55130 | 1.03244 | -1.52410 | 1.06051 | | | |
| 5 | 0.10000 | -1.29963 | 0.81914 | -43.075 | 0.09187 | 5 | -1.47806 | 0.94937 | -1.43863 | 0.99039 | | | |
| 6 | 0.12500 | -1.22027 | 0.74574 | -42.428 | 0.10883 | 6 | -1.40466 | 0.86698 | -1.35331 | 0.92100 | | | |
| 7 | 0.15000 | -1.14092 | 0.67421 | -41.603 | 0.12535 | 7 | -1.33100 | 0.78559 | -1.26826 | 0.85269 | | | |
| 8 | 0.17500 | -1.06156 | 0.60491 | -40.630 | 0.14135 | 8 | -1.25699 | 0.70557 | -1.18356 | 0.78591 | | | |
| 9 | 0.20000 | -0.98220 | 0.53809 | -39.550 | 0.15675 | 9 | -1.18253 | 0.62734 | -1.09930 | 0.72108 | | | |
| 10 | 0.23000 | -0.88697 | 0.46135 | -38.162 | 0.17433 | 10 | -1.10758 | 0.55128 | -1.01554 | 0.65855 | | | |
| 11 | 0.26000 | -0.79175 | 0.38841 | -36.732 | 0.19083 | 11 | -1.03211 | 0.47766 | -0.93230 | 0.59852 | | | |
| 12 | 0.29000 | -0.69652 | 0.31914 | -35.343 | 0.20616 | 12 | -0.94083 | 0.39281 | -0.83312 | 0.52989 | | | |
| 13 | 0.32000 | -0.60129 | 0.25321 | -34.069 | 0.22024 | 13 | -0.84881 | 0.31194 | -0.73468 | 0.46488 | | | |
| 14 | 0.35000 | -0.50606 | 0.19022 | -32.908 | 0.23296 | 14 | -0.75615 | 0.23506 | -0.63589 | 0.40322 | | | |
| 15 | 0.38000 | -0.41083 | 0.12987 | -31.834 | 0.24424 | 15 | -0.66298 | 0.16199 | -0.53960 | 0.34443 | | | |
| 16 | 0.41000 | -0.31561 | 0.07193 | -30.804 | 0.25400 | 16 | -0.56935 | 0.09243 | -0.44278 | 0.28801 | | | |
| 17 | 0.44000 | -0.22038 | 0.01629 | -29.781 | 0.26220 | 17 | -0.47525 | 0.02612 | -0.34642 | 0.23362 | | | |
| 18 | 0.47000 | -0.12515 | -0.03709 | -28.770 | 0.26874 | 18 | -0.38054 | -0.03716 | -0.25057 | 0.18101 | | | |
| 19 | 0.50000 | -0.02992 | -0.08831 | -27.787 | 0.27356 | 19 | -0.28549 | -0.09749 | -0.15526 | 0.13008 | | | |
| 20 | 0.53000 | 0.06531 | -0.13749 | -26.841 | 0.27676 | 20 | -0.18982 | -0.15487 | 0.06048 | 0.08069 | | | |
| 21 | 0.56000 | 0.16053 | -0.18473 | -25.935 | 0.27831 | 21 | -0.09369 | -0.20942 | 0.03344 | 0.03269 | | | |
| 22 | 0.59000 | 0.25576 | -0.23015 | -25.071 | 0.27759 | 22 | 0.00283 | -0.26096 | 0.12779 | 0.01402 | | | |
| 23 | 0.62000 | 0.35099 | -0.27386 | -24.250 | 0.27399 | 23 | 0.09968 | -0.30987 | 0.22139 | -0.05959 | | | |
| 24 | 0.65000 | 0.44622 | -0.31597 | -23.463 | 0.26736 | 24 | 0.19595 | -0.35587 | 0.31458 | 0.10443 | | | |
| 25 | 0.68000 | 0.54145 | -0.35655 | -22.700 | 0.25772 | 25 | 0.29472 | -0.39877 | 0.40726 | -0.14896 | | | |
| 26 | 0.71000 | 0.63667 | -0.39565 | -21.946 | 0.24522 | 26 | 0.39299 | -0.43860 | 0.49944 | -0.19335 | | | |
| 27 | 0.74000 | 0.73190 | -0.43330 | -21.191 | 0.23001 | 27 | 0.49172 | -0.47543 | 0.59117 | -0.23768 | | | |
| 28 | 0.77000 | 0.82713 | -0.46949 | -20.428 | 0.21231 | 28 | 0.59085 | -0.50938 | 0.68250 | -0.28193 | | | |
| 29 | 0.80000 | 0.92236 | -0.50423 | -19.651 | 0.19233 | 29 | 0.69033 | -0.54053 | 0.77348 | -0.32607 | | | |
| 30 | 0.83000 | 1.01759 | -0.53749 | -18.853 | 0.17031 | 30 | 0.79008 | -0.56897 | 0.86418 | -0.37001 | | | |
| 31 | 0.86000 | 1.11282 | -0.56925 | -18.027 | 0.14651 | 31 | 0.89002 | -0.59479 | 0.95470 | -0.41367 | | | |
| 32 | 0.89000 | 1.20804 | -0.59946 | -17.164 | 0.12125 | 32 | 0.99007 | -0.61808 | 1.04510 | -0.45691 | | | |
| 33 | 0.92000 | 1.30327 | -0.62805 | -16.256 | 0.09483 | 33 | 1.09014 | -0.63891 | 1.13549 | -0.49959 | | | |
| 34 | 0.95000 | 1.39850 | -0.65497 | -15.303 | 0.06756 | 34 | 1.19015 | -0.65738 | 1.22593 | -0.54154 | | | |
| 35 | 0.97500 | 1.47786 | -0.67608 | -14.480 | 0.04441 | 35 | 1.29000 | -0.67357 | 1.31654 | -0.58254 | | | |
| 36 | 1.00000 | 1.55721 | 0.69595 | -13.638 | 0.02108 | 36 | 1.38958 | -0.68755 | 1.40741 | -0.62239 | | | |
| | | | | | | 37 | 1.47230 | -0.69758 | 1.48341 | -0.65458 | | | |
| | | | | | | 38 | 1.54421 | -0.70517 | 1.54994 | -0.68180 | | | |
| | | | | | | 39 | 1.55169 | 0.70348 | 1.55592 | -0.68699 | | | |
| | | | | | | 40 | 1.55721 | -0.69595 | 1.55721 | 0.69595 | | | |

CHORD 3.65879 CAMBER 30.629 STAGGER -29.822

PHASE III ROTOR

NB 20

MERIDIONAL AIRFOIL GEOMETRY STREAMLINE 11

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | | | | | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|----------|----------|---------------------|--|--|--|--|--|--|--|--|--|
| PT | PCT X | X | Y | B-M | T(M) | PT | XS | YS | XP | YP | | | | | | | | | |
| 1 | 0. | -1.60872 | 0.91169 | -40.880 | 0.02619 | 1 | -1.60872 | 0.91169 | -1.60872 | 0.91169 | | | | | | | | | |
| 2 | 0.02500 | -1.52727 | 0.84170 | -40.460 | 0.04472 | 2 | -1.61214 | 0.90100 | -1.59882 | 0.91660 | | | | | | | | | |
| 3 | 0.05000 | -1.44581 | 0.77279 | -39.990 | 0.06315 | 3 | -1.60815 | 0.89240 | -1.58957 | 0.91391 | | | | | | | | | |
| 4 | 0.07500 | -1.36436 | 0.70512 | -39.421 | 0.08140 | 4 | -1.54178 | 0.82468 | -1.51276 | 0.85871 | | | | | | | | | |
| 5 | 0.10000 | -1.28291 | 0.63898 | -38.705 | 0.09934 | 5 | -1.46611 | 0.74859 | -1.42552 | 0.79598 | | | | | | | | | |
| 6 | 0.12500 | -1.20145 | 0.57463 | -37.827 | 0.11689 | 6 | -1.39020 | 0.67368 | -1.33852 | 0.73656 | | | | | | | | | |
| 7 | 0.15000 | -1.12000 | 0.51260 | -36.785 | 0.13396 | 7 | -1.31396 | 0.60022 | -1.25185 | 0.67774 | | | | | | | | | |
| 8 | 0.17500 | -1.03854 | 0.45296 | -35.623 | 0.15049 | 8 | -1.23729 | 0.52853 | -1.16561 | 0.62086 | | | | | | | | | |
| 9 | 0.20000 | -0.95709 | 0.39589 | -34.394 | 0.16646 | 9 | -1.16010 | 0.45896 | -1.07989 | 0.56624 | | | | | | | | | |
| 10 | 0.23000 | -0.85934 | 0.33086 | -32.873 | 0.18478 | 10 | -1.08237 | 0.39179 | -0.99471 | 0.51412 | | | | | | | | | |
| 11 | 0.26000 | -0.76160 | 0.26952 | -31.341 | 0.20206 | 11 | -1.00410 | 0.32721 | -0.91007 | 0.46457 | | | | | | | | | |
| 12 | 0.29000 | -0.66385 | 0.21176 | -29.815 | 0.21823 | 12 | -0.90949 | 0.25326 | -0.80920 | 0.40845 | | | | | | | | | |
| 13 | 0.32000 | -0.56611 | 0.15745 | -28.302 | 0.23318 | 13 | -0.81415 | 0.18323 | -0.70905 | 0.35581 | | | | | | | | | |
| 14 | 0.35000 | -0.46836 | 0.10645 | -26.809 | 0.24684 | 14 | -0.71810 | 0.11709 | -0.60960 | 0.30643 | | | | | | | | | |
| 15 | 0.38000 | -0.37061 | 0.05861 | -25.342 | 0.25915 | 15 | -0.62138 | 0.05480 | -0.51083 | 0.26010 | | | | | | | | | |
| 16 | 0.41000 | -0.27287 | 0.01381 | -23.906 | 0.27002 | 16 | -0.52403 | -0.00371 | -0.41269 | 0.21660 | | | | | | | | | |
| 17 | 0.44000 | -0.17512 | -0.02809 | -22.509 | 0.27938 | 17 | -0.42608 | -0.05849 | -0.31515 | 0.17572 | | | | | | | | | |
| 18 | 0.47000 | -0.07738 | -0.06726 | -21.184 | 0.28719 | 18 | -0.32758 | -0.10961 | -0.21816 | 0.13724 | | | | | | | | | |
| 19 | 0.50000 | 0.02037 | -0.10393 | -19.956 | 0.29340 | 19 | -0.22860 | -0.15714 | -0.12165 | 0.10096 | | | | | | | | | |
| 20 | 0.53000 | 0.11811 | -0.13832 | -18.820 | 0.29803 | 20 | -0.12927 | -0.20115 | -0.02549 | 0.06663 | | | | | | | | | |
| 21 | 0.56000 | 0.21586 | -0.17061 | -17.752 | 0.30103 | 21 | -0.02970 | -0.24182 | 0.07044 | 0.03396 | | | | | | | | | |
| 22 | 0.59000 | 0.31360 | -0.20091 | -16.682 | 0.30218 | 22 | 0.07004 | -0.27936 | 0.16618 | 0.00273 | | | | | | | | | |
| 23 | 0.62000 | 0.41135 | -0.22916 | -15.557 | 0.30102 | 23 | 0.16997 | -0.31396 | 0.26175 | -0.02726 | | | | | | | | | |
| 24 | 0.65000 | 0.50909 | -0.25531 | -14.391 | 0.29652 | 24 | 0.27023 | 0.34564 | 0.35697 | -0.05618 | | | | | | | | | |
| 25 | 0.68000 | 0.60684 | -0.27933 | -13.213 | 0.28791 | 25 | 0.37098 | -0.37416 | 0.45171 | -0.08417 | | | | | | | | | |
| 26 | 0.71000 | 0.70458 | -0.30123 | -12.053 | 0.27547 | 26 | 0.47225 | -0.39892 | 0.54594 | -0.11171 | | | | | | | | | |
| 27 | 0.74000 | 0.80233 | -0.32110 | -10.929 | 0.25960 | 27 | 0.57394 | -0.41947 | 0.63974 | -0.13918 | | | | | | | | | |
| 28 | 0.77000 | 0.90008 | -0.33898 | -9.812 | 0.24050 | 28 | 0.67582 | -0.43593 | 0.73335 | -0.16653 | | | | | | | | | |
| 29 | 0.80000 | 0.99782 | -0.35489 | -8.671 | 0.21842 | 29 | 0.77772 | -0.44854 | 0.82694 | -0.19365 | | | | | | | | | |
| 30 | 0.83000 | 1.09557 | 0.36878 | -7.496 | 0.19369 | 30 | 0.87958 | 0.45748 | 0.92057 | -0.22049 | | | | | | | | | |
| 31 | 0.86000 | 1.19331 | -0.38059 | -6.279 | 0.16672 | 31 | 0.98136 | -0.46285 | 1.01429 | -0.24693 | | | | | | | | | |
| 32 | 0.89000 | 1.29106 | -0.39027 | -5.023 | 0.13784 | 32 | 1.08293 | -0.46480 | 1.10820 | -0.27276 | | | | | | | | | |
| 33 | 0.92000 | 1.38880 | -0.39776 | -3.731 | 0.10741 | 33 | 1.18420 | 0.46345 | 1.20243 | -0.29774 | | | | | | | | | |
| 34 | 0.95000 | 1.48655 | -0.40300 | -2.396 | 0.07581 | 34 | 1.28502 | -0.45892 | 1.29709 | -0.32162 | | | | | | | | | |
| 35 | 0.97500 | 1.56800 | -0.40559 | -1.249 | 0.04886 | 35 | 1.38531 | -0.45135 | 1.39230 | -0.34417 | | | | | | | | | |
| 36 | 1.00000 | 1.64946 | -0.40654 | -0.084 | 0.02162 | 36 | 1.48496 | -0.44087 | 1.48813 | -0.36512 | | | | | | | | | |
| | | | | | | 37 | 1.56747 | 0.43001 | 1.56853 | -0.38117 | | | | | | | | | |
| | | | | | | 38 | 1.63874 | -0.41911 | 1.63885 | -0.39392 | | | | | | | | | |
| | | | | | | 39 | 1.64572 | -0.41553 | 1.64607 | -0.39784 | | | | | | | | | |
| | | | | | | 40 | 1.64946 | -0.40654 | 1.64946 | -0.40654 | | | | | | | | | |

CHORD 3.51475 CAMBER 40.796 STAGGER 22.028

PHASE III ROTOR

MERIDIONAL AIRFOIL GEOMETRY - STREAMLINE 12

N8 20

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|----------|----------|---------------------|--|--|--|
| PT | PCT X | X | Y | B.M | T(M) | PI | XS | YS | XP | YP | | | |
| 1 | 0. | -1.63314 | 0.79810 | -38.150 | 0.03473 | 1 | -1.63314 | 0.79810 | -1.63314 | 0.79810 | | | |
| 2 | 0.02500 | -1.55063 | 0.73402 | -37.504 | 0.05686 | 2 | -1.63706 | 0.78354 | -1.62030 | 0.80534 | | | |
| 3 | 0.05000 | -1.46811 | 0.67148 | -3.12 | 0.07884 | 3 | -1.63137 | 0.77233 | -1.60772 | 0.80256 | | | |
| 4 | 0.07500 | -1.38560 | 0.61056 | -36.050 | 0.10050 | 4 | -1.56793 | 0.71147 | -1.53332 | 0.75658 | | | |
| 5 | 0.10000 | -1.30309 | 0.55141 | -35.199 | 0.12169 | 5 | -1.49173 | 0.63992 | -1.44450 | 0.70304 | | | |
| 6 | 0.12500 | -1.22058 | 0.49421 | -34.247 | 0.14227 | 6 | -1.41518 | 0.56993 | -1.35603 | 0.65119 | | | |
| 7 | 0.15000 | -1.13807 | 0.43912 | -33.192 | 0.16213 | 7 | -1.33816 | 0.50169 | -1.26802 | 0.60113 | | | |
| 8 | 0.17500 | -1.05556 | 0.38629 | -32.056 | 0.18119 | 8 | -1.26061 | 0.43541 | -1.18055 | 0.55301 | | | |
| 9 | 0.20000 | -0.97305 | 0.33580 | -30.864 | 0.19938 | 9 | -1.18245 | 0.37128 | -1.09369 | 0.50696 | | | |
| 10 | 0.23000 | -0.87404 | 0.27833 | -29.391 | 0.21993 | 10 | -1.10364 | 0.30951 | -1.00748 | 0.46307 | | | |
| 11 | 0.26000 | -0.77502 | 0.22424 | -27.898 | 0.23892 | 11 | -1.02419 | 0.25023 | -0.92191 | 0.42137 | | | |
| 12 | 0.29000 | -0.67601 | 0.17346 | -26.404 | 0.25670 | 12 | -0.93092 | 0.18866 | -0.82007 | 0.37414 | | | |
| 13 | 0.32000 | -0.57700 | 0.12589 | -24.924 | 0.27162 | 13 | -0.83052 | 0.11866 | -0.71913 | 0.32982 | | | |
| 14 | 0.35000 | -0.47796 | 0.08140 | -23.464 | 0.28505 | 14 | -0.73297 | 0.05872 | -0.61904 | 0.28820 | | | |
| 15 | 0.38000 | -0.37897 | 0.03989 | -22.026 | 0.29640 | 15 | -0.63423 | 0.00273 | -0.51975 | 0.24904 | | | |
| 16 | 0.41000 | -0.27996 | 0.00125 | -20.611 | 0.30559 | 16 | -0.53473 | -0.04934 | -0.42123 | 0.21214 | | | |
| 17 | 0.44000 | -0.18094 | -0.03462 | -19.223 | 0.31255 | 17 | -0.43455 | -0.09749 | -0.32339 | 0.17728 | | | |
| 18 | 0.47000 | -0.08193 | -0.06784 | -17.884 | 0.31728 | 18 | -0.33374 | -0.14176 | -0.22617 | 0.14427 | | | |
| 19 | 0.50000 | 0.01708 | -0.09857 | -16.608 | 0.31973 | 19 | -0.23240 | -0.18218 | -0.12949 | 0.11294 | | | |
| 20 | 0.53000 | 0.11610 | -0.12696 | -15.391 | 0.31975 | 20 | -0.13065 | -0.21882 | -0.03321 | 0.08313 | | | |
| 21 | 0.56000 | 0.21511 | -0.15312 | -14.211 | 0.31718 | 21 | -0.02861 | -0.25177 | 0.06278 | 0.05462 | | | |
| 22 | 0.59000 | 0.31412 | -0.17711 | -13.021 | 0.31195 | 22 | 0.07367 | -0.28110 | 0.15853 | 0.02718 | | | |
| 23 | 0.62000 | 0.41314 | -0.19889 | -11.791 | 0.30403 | 23 | 0.17618 | -0.30686 | 0.25404 | 0.00062 | | | |
| 24 | 0.65000 | 0.51215 | -0.21844 | -10.544 | 0.29356 | 24 | 0.27898 | -0.32907 | 0.34927 | -0.02514 | | | |
| 25 | 0.68000 | 0.61116 | -0.23576 | -9.309 | 0.28071 | 25 | 0.38208 | -0.34770 | 0.44420 | -0.05008 | | | |
| 26 | 0.71000 | 0.71018 | -0.25093 | -8.114 | 0.26562 | 26 | 0.48529 | -0.36274 | 0.53901 | -0.07413 | | | |
| 27 | 0.74000 | 0.80919 | -0.26401 | -6.940 | 0.24847 | 27 | 0.58846 | -0.37427 | 0.63387 | -0.09726 | | | |
| 28 | 0.77000 | 0.90820 | -0.27498 | -5.668 | 0.22944 | 28 | 0.69143 | -0.38241 | 0.72892 | -0.11945 | | | |
| 29 | 0.80000 | 1.00722 | -0.28355 | -4.197 | 0.20873 | 29 | 0.79418 | -0.38734 | 0.82420 | -0.14069 | | | |
| 30 | 0.83000 | 1.10623 | -0.28938 | -2.503 | 0.18659 | 30 | 0.89687 | -0.38914 | 0.91953 | -0.16082 | | | |
| 31 | 0.86000 | 1.20524 | -0.29209 | 0.599 | 0.16322 | 31 | 0.99958 | -0.38764 | 1.01486 | -0.17947 | | | |
| 32 | 0.89000 | 1.30426 | -0.29138 | 1.431 | 0.13883 | 32 | 1.10216 | -0.38259 | 1.11030 | -0.19618 | | | |
| 33 | 0.92000 | 1.40327 | -0.28711 | 3.514 | 0.11359 | 33 | 1.20439 | -0.37370 | 1.20610 | -0.21049 | | | |
| 34 | 0.95000 | 1.50228 | -0.27918 | 5.656 | 0.08762 | 34 | 1.30599 | -0.36077 | 1.30252 | -0.22199 | | | |
| 35 | 0.97500 | 1.58479 | -0.26968 | 7.490 | 0.06553 | 35 | 1.40675 | -0.34380 | 1.39979 | -0.23043 | | | |
| 36 | 1.00000 | 1.66731 | -0.25747 | 9.341 | 0.04322 | 36 | 1.50660 | -0.32278 | 1.49797 | -0.23559 | | | |
| | | | | | | 37 | 1.58907 | -0.30216 | 1.58052 | -0.23719 | | | |
| | | | | | | 38 | 1.64990 | -0.28505 | 1.64241 | -0.23668 | | | |
| | | | | | | 39 | 1.66258 | -0.27630 | 1.65803 | -0.24183 | | | |
| | | | | | | 40 | 1.66731 | -0.25747 | 1.66731 | -0.25747 | | | |

CHORD 3.46513 CAMBER 47.491 STAGGER -17.736

PHASE III ROTOR

NB 20

MEANLINE AIRFOIL GEOMETRY - STREAMLINE 13

| MEANLINE DATA | | | | | | | | | | SURFACE COORDINATES | | | | | | | | | |
|---------------|---------|----------|----------|---------|---------|----|----------|----------|----------|---------------------|--|--|--|--|--|--|--|--|--|
| PT | PCT X | X | Y | B.M | T(M) | PT | XS | YS | XP | YP | | | | | | | | | |
| 1 | 0. | -1.67260 | 0.69954 | -32.312 | 0.05299 | 1 | -1.67260 | 0.69954 | -1.67260 | 0.69954 | | | | | | | | | |
| 2 | 0.02500 | -1.58879 | 0.64673 | -32.115 | 0.07337 | 2 | -1.67634 | 0.67705 | -1.65408 | 0.71254 | | | | | | | | | |
| 3 | 0.05000 | -1.50498 | 0.59437 | -31.863 | 0.09366 | 3 | -1.66591 | 0.66077 | -1.63474 | 0.71016 | | | | | | | | | |
| 4 | 0.07500 | -1.42117 | 0.54260 | -31.524 | 0.11378 | 4 | -1.60829 | 0.61566 | -1.56929 | 0.67780 | | | | | | | | | |
| 5 | 0.10000 | -1.33736 | 0.49162 | -31.073 | 0.13361 | 5 | -1.52970 | 0.55459 | -1.48026 | 0.63414 | | | | | | | | | |
| 6 | 0.12500 | -1.25355 | 0.44167 | -30.495 | 0.15303 | 6 | -1.45091 | 0.49410 | -1.39142 | 0.59109 | | | | | | | | | |
| 7 | 0.15000 | -1.16974 | 0.39299 | -29.777 | 0.17192 | 7 | -1.37184 | 0.43440 | -1.30288 | 0.54884 | | | | | | | | | |
| 8 | 0.17500 | -1.08592 | 0.34585 | -28.913 | 0.19014 | 8 | -1.29238 | 0.37574 | -1.21472 | 0.50760 | | | | | | | | | |
| 9 | 0.20000 | -1.00211 | 0.30049 | -27.904 | 0.20760 | 9 | -1.21243 | 0.31838 | -1.12705 | 0.46760 | | | | | | | | | |
| 10 | 0.23000 | -0.90154 | 0.24874 | -26.518 | 0.22739 | 10 | -1.13189 | 0.26262 | -1.03996 | 0.42907 | | | | | | | | | |
| 11 | 0.26000 | -0.80097 | 0.20021 | -24.979 | 0.24580 | 11 | -1.05069 | 0.20876 | -0.95354 | 0.39222 | | | | | | | | | |
| 12 | 0.29000 | -0.70039 | 0.15506 | -23.359 | 0.26269 | 12 | -0.95230 | 0.14701 | -0.85078 | 0.35047 | | | | | | | | | |
| 13 | 0.32000 | -0.59982 | 0.11331 | -21.729 | 0.27797 | 13 | -0.85286 | 0.08881 | -0.74907 | 0.31161 | | | | | | | | | |
| 14 | 0.35000 | -0.49924 | 0.07485 | -20.145 | 0.29155 | 14 | -0.75247 | 0.03448 | -0.64831 | 0.27565 | | | | | | | | | |
| 15 | 0.38000 | -0.39867 | 0.03944 | -18.656 | 0.30336 | 15 | -0.65127 | -0.01580 | -0.54836 | 0.24243 | | | | | | | | | |
| 16 | 0.41000 | -0.29810 | 0.00683 | -17.302 | 0.31336 | 16 | -0.54945 | -0.06201 | -0.44904 | 0.21170 | | | | | | | | | |
| 17 | 0.44000 | -0.19752 | -0.02331 | -16.080 | 0.32149 | 17 | -0.44719 | -0.10427 | -0.35015 | 0.18315 | | | | | | | | | |
| 18 | 0.47000 | -0.09695 | -0.05122 | -14.946 | 0.32767 | 18 | -0.34470 | -0.14276 | -0.25150 | 0.15642 | | | | | | | | | |
| 19 | 0.50000 | 0.00362 | -0.07704 | -13.855 | 0.33191 | 19 | -0.24205 | -0.17777 | -0.15300 | 0.13115 | | | | | | | | | |
| 20 | 0.53000 | 0.10420 | -0.10084 | -12.766 | 0.33431 | 20 | -0.13921 | -0.20951 | -0.05470 | 0.10708 | | | | | | | | | |
| 21 | 0.56000 | 0.20477 | -0.12260 | -11.636 | 0.33465 | 21 | -0.03612 | -0.23817 | 0.04337 | 0.08409 | | | | | | | | | |
| 22 | 0.59000 | 0.30534 | -0.14222 | -10.423 | 0.33248 | 22 | 0.06726 | -0.26386 | 0.14113 | 0.06218 | | | | | | | | | |
| 23 | 0.62000 | 0.40592 | -0.15953 | -9.092 | 0.32759 | 23 | 0.17102 | -0.28648 | 0.23852 | 0.04129 | | | | | | | | | |
| 24 | 0.65000 | 0.50649 | -0.17433 | -7.621 | 0.32002 | 24 | 0.27527 | -0.30571 | 0.33542 | 0.02128 | | | | | | | | | |
| 25 | 0.68000 | 0.60707 | -0.18635 | -5.989 | 0.30992 | 25 | 0.38003 | -0.32127 | 0.43180 | 0.00220 | | | | | | | | | |
| 26 | 0.71000 | 0.70764 | -0.19533 | -4.182 | 0.29751 | 26 | 0.48527 | -0.33293 | 0.52771 | -0.01573 | | | | | | | | | |
| 27 | 0.74000 | 0.80821 | -0.20096 | -2.190 | 0.28300 | 27 | 0.59090 | -0.34047 | 0.62323 | -0.03224 | | | | | | | | | |
| 28 | 0.77000 | 0.90879 | -0.20291 | 0.004 | 0.26663 | 28 | 0.69679 | 0.34369 | 0.71849 | -0.04697 | | | | | | | | | |
| 29 | 0.80000 | 1.00936 | -0.20086 | 2.372 | 0.24864 | 29 | 0.80281 | 0.34236 | 0.81362 | -0.05956 | | | | | | | | | |
| 30 | 0.83000 | 1.10993 | -0.19448 | 4.917 | 0.22924 | 30 | 0.90978 | -0.33623 | 0.90879 | -0.06960 | | | | | | | | | |
| 31 | 0.86000 | 1.21051 | -0.18346 | 7.598 | 0.20862 | 31 | 1.01450 | -0.32507 | 1.00422 | -0.07665 | | | | | | | | | |
| 32 | 0.89000 | 1.31108 | -0.16758 | 10.356 | 0.18691 | 32 | 1.11976 | -0.30867 | 1.10011 | -0.08028 | | | | | | | | | |
| 33 | 0.92000 | 1.41165 | -0.14666 | 13.150 | 0.16420 | 33 | 1.22430 | -0.28685 | 1.19671 | -0.08007 | | | | | | | | | |
| 34 | 0.95000 | 1.51223 | -0.12052 | 15.987 | 0.14051 | 34 | 1.32788 | -0.25951 | 1.29428 | -0.07555 | | | | | | | | | |
| 35 | 0.97500 | 1.59604 | -0.09460 | 18.380 | 0.12009 | 35 | 1.43033 | -0.22660 | 1.39298 | -0.06671 | | | | | | | | | |
| 36 | 1.00000 | 1.67985 | -0.06480 | 20.750 | 0.09935 | 36 | 1.53158 | -0.18806 | 1.49288 | -0.05298 | | | | | | | | | |
| | | | | | | 37 | 1.61497 | -0.15158 | 1.57711 | -0.03761 | | | | | | | | | |
| | | | | | | 38 | 1.65183 | -0.13408 | 1.61525 | -0.02946 | | | | | | | | | |
| | | | | | | 39 | 1.67707 | -0.10938 | 1.65254 | -0.03408 | | | | | | | | | |
| | | | | | | 40 | 1.67985 | -0.06480 | 1.67985 | 0.06480 | | | | | | | | | |

STAGGER -12.844

CAMBER 53.062

CHORD 3.43848

3.0 PLANE SECTION BLADE COORDINATES

Figure 55 shows the stacked Phase III rotor plane sections. The following tabulation gives the coordinates for these sections. These sections are spaced one half inch apart, beginning at the tip height of 8.5 inches and progressing inward to 2.5 inches. These are the same section locations as given for the base line rotor in Reference 1. Also included in the tabulation are coordinates for the section meanline, the meanline angle, and the section percent thickness at each point. Plane section chord, camber angle, and stagger angle are also given. These coordinates are intended to represent the blade under hot running conditions and do not include any corrections for blade untwist, meanline deformation, centrifugal growth or thermal growth.

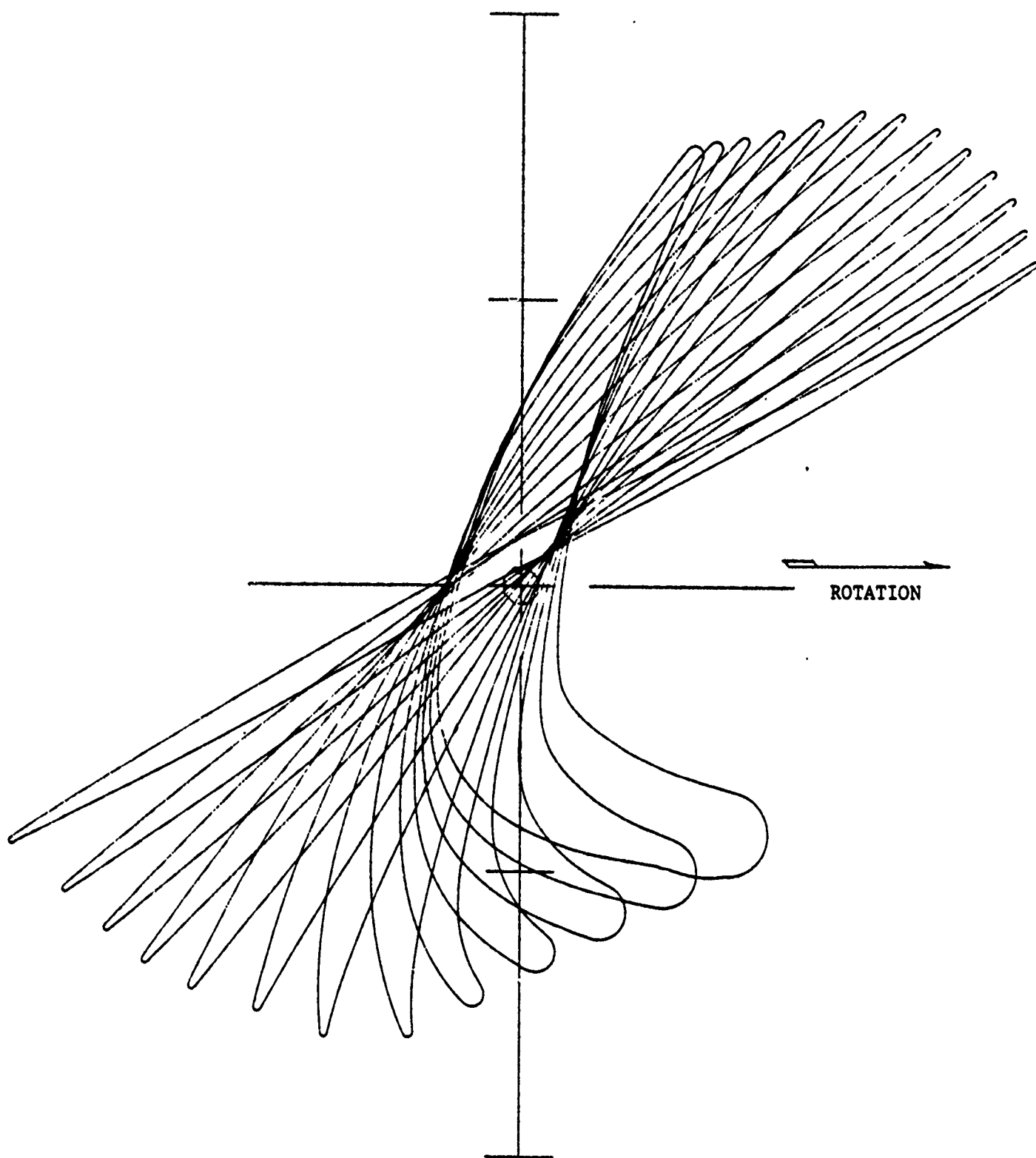


Figure 55. Stacked Phase III Rotor Plane Sections

PHASE III MOTOR

7DC

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O. ETA O.

STAGE 3 ROTOR NR. 20 RIM 8.5000

SECTION NO 1 SECTION AA

MEANLINE INPUT DATA

| PI | ALPHA | ZEI | THICKNESS | UPSILON |
|----|----------|--------|-----------|----------|
| 1 | -1.07809 | 57.235 | 0.01888 | 1.78986 |
| 2 | 1.03248 | 57.651 | 0.02332 | 1.71825 |
| 3 | 0.93993 | 58.482 | 0.03216 | 1.56349 |
| 4 | 0.84594 | 59.336 | 0.04087 | 1.41322 |
| 5 | 0.75024 | 60.296 | 0.04927 | 1.24869 |
| 6 | 0.64325 | 61.519 | 0.05807 | 1.05649 |
| 7 | 0.52468 | 62.775 | 0.06692 | 0.83168 |
| 8 | 0.40438 | 63.611 | 0.07485 | 0.59296 |
| 9 | 0.28275 | 63.811 | 0.08169 | 0.34613 |
| 10 | 0.16062 | 63.276 | 0.08732 | 0.10110 |
| 11 | 0.03958 | 62.305 | 0.09165 | -0.13756 |
| 12 | 0.08281 | 61.326 | 0.09466 | -0.36406 |
| 13 | 0.20319 | 60.835 | 0.09634 | -0.58141 |
| 14 | 0.32191 | 60.792 | 0.09608 | -0.79403 |
| 15 | 0.43863 | 60.961 | 0.09007 | -1.00373 |
| 16 | 0.55311 | 61.383 | 0.07801 | -1.21153 |
| 17 | 0.66472 | 61.820 | 0.06075 | -1.41859 |
| 18 | 0.77327 | 61.539 | 0.03947 | -1.62104 |
| 19 | 0.86174 | 60.630 | 0.01983 | -1.78123 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | XC | AI | T/C | ALPHA | UPSILON | ZETA |
|----|--------|----|---------|----------|---------|--------|
| 1 | 0 | | 0.00464 | -1.07809 | 1.78986 | 57.434 |
| 2 | 0.0250 | | 0.00581 | -1.02959 | 1.71368 | 57.688 |
| 3 | 0.0500 | | 0.00695 | -0.98109 | 1.63630 | 58.159 |
| 4 | 0.0750 | | 0.00808 | -0.93260 | 1.55749 | 58.620 |
| 5 | 0.1000 | | 0.00920 | -0.88410 | 1.47729 | 59.056 |
| 6 | 0.1250 | | 0.01029 | -0.83561 | 1.39573 | 59.464 |
| 7 | 0.1500 | | 0.01134 | -0.78711 | 1.31281 | 59.908 |
| 8 | 0.1750 | | 0.01237 | -0.73862 | 1.22827 | 60.414 |
| 9 | 0.2000 | | 0.01336 | 0.69012 | 1.14191 | 60.962 |
| 10 | 0.2300 | | 0.01451 | 0.63193 | 1.03557 | 61.660 |
| 11 | 0.2600 | | 0.01560 | 0.57373 | 0.92615 | 62.311 |
| 12 | 0.2900 | | 0.01662 | 0.51554 | 0.81386 | 62.878 |
| 13 | 0.3200 | | 0.01759 | -0.45734 | 0.69908 | 63.326 |
| 14 | 0.3500 | | 0.01850 | 0.39915 | 0.58240 | 63.639 |
| 15 | 0.3800 | | 0.01933 | -0.34095 | 0.46448 | 63.801 |
| 16 | 0.4100 | | 0.02010 | -0.28276 | 0.34614 | 63.799 |
| 17 | 0.4400 | | 0.02080 | -0.22456 | 0.22822 | 63.640 |

COORD SYSTEM ORIGIN Z -7.04880 R O. MJ O. EIA O.
 SECTION NO 1 SECTION AA RHO 8.5000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AL | T/C | ALPHA | UPSILON | ZETA |
|----|--------|---------|----------|----------|--------|
| 18 | 0.4700 | 0.02143 | 0.16637 | 0.11152 | 63.323 |
| 19 | 0.5000 | 0.02198 | -0.10817 | -0.00324 | 62.891 |
| 20 | 0.5300 | 0.02247 | 0.04998 | -0.11579 | 62.413 |
| 21 | 0.5600 | 0.02288 | 0.00822 | -0.22599 | 61.915 |
| 22 | 0.5900 | 0.02321 | 0.06641 | -0.33399 | 61.456 |
| 23 | 0.6200 | 0.02347 | 0.12461 | -0.44007 | 61.074 |
| 24 | 0.6500 | 0.02365 | 0.18280 | -0.54487 | 60.866 |
| 25 | 0.6800 | 0.02378 | 0.24100 | -0.64914 | 60.816 |
| 26 | 0.7100 | 0.02374 | 0.29919 | -0.75333 | 60.822 |
| 27 | 0.7400 | 0.02336 | 0.35739 | -0.85765 | 60.870 |
| 28 | 0.7700 | 0.02258 | 0.41558 | -0.96222 | 60.942 |
| 29 | 0.8000 | 0.02141 | 0.47378 | -1.06717 | 61.055 |
| 30 | 0.8300 | 0.01985 | 0.53197 | -1.17285 | 61.286 |
| 31 | 0.8600 | 0.01793 | 0.59017 | -1.27978 | 61.599 |
| 32 | 0.8900 | 0.01565 | 0.64836 | -1.38799 | 61.842 |
| 33 | 0.9200 | 0.01305 | 0.70656 | -1.49701 | 61.908 |
| 34 | 0.9500 | 0.01016 | 0.76475 | -1.60536 | 61.533 |
| 35 | 0.9750 | 0.00756 | 0.81325 | -1.69387 | 61.071 |
| 36 | 1.0000 | 0.00488 | 0.86174 | -1.78123 | 60.911 |

CHIRI 4.0539
 STAGGER 61.489
 CAMBER -3.477

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | T/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------|---------------|-------------|---------|
| 1 | 0.00464 | -1.07809 | 1.78986 | -1.07809 | 1.78986 |
| 2 | 0.00464 | -1.08240 | 1.78341 | -1.07032 | 1.79105 |
| 3 | 0.00464 | -1.08116 | 1.77669 | -1.06484 | 1.78714 |
| 4 | 0.00581 | -1.03956 | 1.70737 | -1.01962 | 1.71999 |
| 5 | 0.00695 | -0.99310 | 1.62884 | -0.96909 | 1.64375 |
| 6 | 0.00808 | -0.94662 | 1.54894 | -0.91857 | 1.56605 |
| 7 | 0.00920 | -0.90013 | 1.46768 | -0.86807 | 1.48690 |
| 8 | 0.01029 | -0.85361 | 1.38512 | -0.81761 | 1.40635 |
| 9 | 0.01134 | -0.80705 | 1.30125 | -0.76717 | 1.32436 |
| 10 | 0.01237 | -0.76047 | 1.21587 | -0.71676 | 1.24068 |
| 11 | 0.01336 | -0.71386 | 1.12873 | -0.66638 | 1.15509 |
| 12 | 0.01451 | -0.65787 | 1.02157 | -0.60598 | 1.04956 |
| 13 | 0.01560 | -0.60179 | 0.91142 | -0.54567 | 0.94087 |
| 14 | 0.01662 | -0.54560 | 0.79846 | -0.48547 | 0.82926 |

PHASE III ROTOR

• 7100 •

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O. ETA O.

SECTION NO 1 SECTION AA RH0 8.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | T/C | UPPER ALPHA | UPPER UPSILON | LOWER ALPHA | LOWER UPSILON |
|--------|---------|-----------------|---------------|-------------|---------------|
| 15 | 0 01759 | -0.48928 | 0.68304 | -0.42540 | 0.71513 |
| 16 | 0 01850 | -0.43282 | 0.56571 | -0.36547 | 0.59908 |
| 17 | 0 01943 | -0.37620 | 0.44713 | -0.30571 | 0.48182 |
| 18 | 0 02040 | -0.31940 | 0.32811 | -0.24611 | 0.36417 |
| 19 | 0 02140 | -0.26243 | 0.20946 | -0.18669 | 0.24699 |
| 20 | 0 02143 | -0.20527 | 0.09178 | -0.12746 | 0.13107 |
| 21 | 0 02198 | -0.14793 | -0.02360 | -0.06841 | 0.01711 |
| 22 | 0 02247 | -0.09044 | -0.13693 | -0.00952 | 0.09465 |
| 23 | 0 02288 | -0.03279 | -0.24787 | 0.04923 | -0.20411 |
| 24 | 0 02321 | 0.02498 | -0.35653 | 0.10784 | -0.31145 |
| 25 | 0 02347 | 0.08287 | -0.46314 | 0.16634 | -0.41701 |
| 26 | 0 02365 | 0.14082 | -0.56826 | 0.22478 | -0.52147 |
| 27 | 0 02378 | 0.19881 | -0.67270 | 0.28318 | -0.62558 |
| 28 | 0 02374 | 0.25707 | -0.77685 | 0.34131 | -0.72981 |
| 29 | 0 02336 | 0.31592 | -0.88076 | 0.39886 | -0.83453 |
| 30 | 0 02258 | 0.37547 | -0.98451 | 0.45569 | -0.93993 |
| 31 | 0 02141 | 0.43571 | -1.08822 | 0.51184 | -1.04611 |
| 32 | 0 01985 | 0.49659 | -1.19223 | 0.56735 | -1.15347 |
| 33 | 0 01793 | 0.55812 | -1.29711 | 0.62271 | -1.26246 |
| 34 | 0 01565 | 0.62033 | -1.40299 | 0.67640 | -1.37298 |
| 35 | 0 01305 | 0.68317 | -1.50949 | 0.72994 | -1.48452 |
| 36 | 0 01016 | 0.74661 | -1.61520 | 0.78290 | -1.59552 |
| 37 | 0 00756 | 0.79979 | -1.70131 | 0.82670 | -1.68644 |
| 38 | 0 00488 | 0.84777 | -1.77766 | 0.86562 | -1.76660 |
| 39 | 0 00188 | 0.89342 | -1.78204 | 0.86691 | -1.77424 |
| 40 | 0 00188 | 0.86174 | -1.78123 | 0.86174 | -1.78123 |
| LE RAD | 0 00969 | CENTER AT ALPHA | -1.07286 | UPSILON | 1.78170 |
| TF RAD | 0.01050 | CENTER AT ALPHA | 0.85665 | UPSILON | -1.77206 |

•7PL•

PHASE III ROTOR

| | | | | | | | | | | |
|------------------------------|---|------------|--------------------|--------|----------|-----|--------|----|-----|----|
| COORD SYSTEM ORIGIN | Z | -7.04880 | R | 0 | MU | 0. | NR | 20 | ETA | 0. |
| SECTION NO | 1 | SECTION AA | | | | RND | 8.5000 | | | |
| CHORD | 4 | 0639 | STAGGER | 61.489 | CAMBER | | -3.477 | | | |
| AREA | 0 | 284298 | SURFACE ARC LENGTH | | 8.15448 | | | | | |
| SECTION C.G. | | | ALPHA | | UPSILON | | | | | |
| SURFACE SURFACE SECTION C.G. | | | -0.03327 | | -0.12177 | | | | | |
| BLADE AXIS | | | -0.03869 | | -0.10763 | | | | | |
| STACKING AXIS (RADIAL) | | | 0.00210 | | 0. | | | | | |

PHASE III ROTOR

COORD SYSTEM ORIGIN 2 -7.04880 R O. MJ O. E1A O.
 STAGE 3. ROTOR NR 20
 SECTION NO 2 SECTION RR RND 8.0000

MEANLINE INPUT DATA

| PT | ALPHA | ZETA* | THICKNESS | UPSILON |
|----|----------|--------|-----------|----------|
| 1 | 1.18293 | 55.367 | 0.01973 | 1.75033 |
| 2 | 1.13124 | 55.814 | 0.02453 | 1.67495 |
| 3 | 1.02672 | 56.653 | 0.03413 | 1.51853 |
| 4 | -0.92044 | 57.438 | 0.04362 | 1.35458 |
| 5 | 0.81248 | 58.183 | 0.05287 | 1.18301 |
| 6 | 0.69176 | 58.995 | 0.06257 | 0.98539 |
| 7 | 0.55821 | 59.771 | 0.07238 | 0.75935 |
| 8 | 0.42287 | 60.099 | 0.08112 | 0.52484 |
| 9 | 0.28624 | 59.468 | 0.08854 | 0.28915 |
| 10 | 0.14902 | 57.744 | 0.09443 | 0.06356 |
| 11 | 0.01175 | 55.983 | 0.09873 | -0.14649 |
| 12 | 0.12520 | 54.887 | 0.10141 | -0.34492 |
| 13 | 0.26124 | 54.389 | 0.10245 | -0.53653 |
| 14 | 0.39620 | 54.257 | 0.10013 | -0.72448 |
| 15 | 0.52969 | 54.272 | 0.09190 | -0.90987 |
| 16 | 0.66115 | 54.368 | 0.07835 | -1.09292 |
| 17 | 0.79029 | 54.384 | 0.06047 | -1.27324 |
| 18 | 0.91705 | 54.094 | 0.03956 | -1.44934 |
| 19 | 1.02058 | 53.629 | 0.02081 | -1.59154 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AI | T/C | ALPHA | UPSILON | ZETA* |
|----|--------|---------|----------|---------|--------|
| 1 | 0 | 0.00493 | -1.18293 | 1.75033 | 55.367 |
| 2 | 0.0250 | 0.00621 | -1.12784 | 1.66996 | 55.815 |
| 3 | 0.0500 | 0.00748 | -1.07275 | 1.58806 | 56.313 |
| 4 | 0.0750 | 0.00873 | -1.01767 | 1.50475 | 56.727 |
| 5 | 0.1000 | 0.00997 | -0.96258 | 1.42017 | 57.127 |
| 6 | 0.1250 | 0.01118 | -0.90749 | 1.33428 | 57.531 |
| 7 | 0.1500 | 0.01237 | -0.85240 | 1.24704 | 57.920 |
| 8 | 0.1750 | 0.01352 | -0.79732 | 1.15853 | 58.277 |
| 9 | 0.2000 | 0.01464 | -0.74223 | 1.06878 | 58.643 |
| 10 | 0.2250 | 0.01593 | -0.67612 | 0.95931 | 59.106 |
| 11 | 0.2500 | 0.01716 | -0.61002 | 0.84789 | 59.522 |
| 12 | 0.2750 | 0.01833 | -0.54391 | 0.73477 | 59.861 |
| 13 | 0.3000 | 0.01942 | -0.47781 | 0.62038 | 60.065 |
| 14 | 0.3250 | 0.02043 | 0.41170 | 0.50541 | 60.110 |
| 15 | 0.3500 | 0.02136 | 0.34560 | 0.39076 | 59.933 |
| 16 | 0.3750 | 0.02220 | 0.27949 | 0.27772 | 59.399 |
| 17 | 0.4000 | 0.02295 | -0.21339 | 0.16751 | 58.663 |

PHASE III ROTOR

COORD SYSTEM ORIGIN Z -7.04880 R 0.0 MU 0.0 EIA 0.0
SECTION NO 2 SECTION BB RND 8.00000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AL | T/C | ALPHA | UPSILON | ZETA |
|----|--------|---------|----------|----------|--------|
| 18 | 0.4700 | 0.02361 | -0.14728 | 0.06079 | 57.747 |
| 19 | 0.5000 | 0.02417 | -0.08118 | -0.04205 | 56.809 |
| 20 | 0.5300 | 0.02464 | 0.01507 | -0.14156 | 56.024 |
| 21 | 0.5600 | 0.02502 | 0.05103 | -0.23847 | 55.402 |
| 22 | 0.5900 | 0.02531 | 0.11714 | -0.33344 | 54.948 |
| 23 | 0.6200 | 0.02551 | 0.18324 | -0.42710 | 54.642 |
| 24 | 0.6500 | 0.02559 | 0.24935 | -0.51989 | 54.442 |
| 25 | 0.6800 | 0.02551 | 0.31545 | -0.61217 | 54.330 |
| 26 | 0.7100 | 0.02514 | 0.38156 | -0.70413 | 54.262 |
| 27 | 0.7400 | 0.02440 | 0.44766 | -0.79595 | 54.238 |
| 28 | 0.7700 | 0.02328 | 0.51377 | -0.88775 | 54.253 |
| 29 | 0.8000 | 0.02181 | 0.57987 | -0.97966 | 54.289 |
| 30 | 0.8300 | 0.02003 | 0.64598 | -1.07175 | 54.360 |
| 31 | 0.8600 | 0.01793 | 0.71209 | -1.16405 | 54.405 |
| 32 | 0.8900 | 0.01557 | 0.77819 | -1.25636 | 54.368 |
| 33 | 0.9200 | 0.01297 | 0.84430 | -1.34843 | 54.271 |
| 34 | 0.9500 | 0.01017 | 0.91040 | -1.44014 | 54.159 |
| 35 | 0.9750 | 0.00772 | 0.96549 | -1.51620 | 53.987 |
| 36 | 1.0000 | 0.00520 | 1.02058 | -1.59154 | 53.629 |

CHORD 4.0129 STAGGER 56.601 CAMBER 1.738

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | I/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------|---------------|-------------|----------|
| 1 | 0.00493 | -1.18293 | 1.75033 | -1.18293 | 1.75033 |
| 2 | 0.00493 | -1.18719 | 1.74345 | -1.17485 | 1.75185 |
| 3 | 0.00493 | -1.18565 | 1.73646 | -1.16900 | 1.74797 |
| 4 | 0.00621 | -1.13812 | 1.66298 | -1.11757 | 1.67693 |
| 5 | 0.00748 | -1.08520 | 1.57976 | -1.06030 | 1.59636 |
| 6 | 0.00873 | -1.03228 | 1.49516 | -1.00306 | 1.51434 |
| 7 | 0.00997 | -0.97933 | 1.40934 | -0.94583 | 1.43100 |
| 8 | 0.01118 | -0.92637 | 1.32226 | -0.88861 | 1.34629 |
| 9 | 0.01237 | -0.87338 | 1.23389 | -0.83143 | 1.26018 |
| 10 | 0.01352 | -0.82034 | 1.14430 | -0.77430 | 1.17276 |
| 11 | 0.01464 | 0.76725 | 1.05354 | -0.71721 | -1.08403 |
| 12 | 0.01583 | -0.70348 | 0.94294 | -0.64876 | 0.97569 |
| 13 | 0.01716 | -0.63962 | 0.83047 | -0.58042 | 0.86531 |
| 14 | 0.01833 | -0.57563 | 0.71635 | -0.51219 | 0.75319 |

PHASE III ROTOR

•7100

COORD SYSTEM ORIGIN Z -7.04880 R 0. MJ 0. FIA 0.

SECTION NO 2 SECTION RP RHO 8.0000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | I/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|--------|---------|-----------------|---------------|-------------|----------|
| 15 | 0.01942 | -0.51149 | 0.60099 | -0.44413 | 0.63977 |
| 16 | 0.02043 | -0.44715 | 0.48504 | -0.37625 | 0.52579 |
| 17 | 0.02136 | -0.38259 | 0.36932 | -0.30861 | 0.41219 |
| 18 | 0.02220 | -0.31774 | 0.25511 | -0.24125 | 0.30034 |
| 19 | 0.02295 | -0.25262 | 0.14362 | -0.17416 | 0.19139 |
| 20 | 0.02361 | -0.18724 | 0.03558 | -0.10732 | 0.08601 |
| 21 | 0.02417 | -0.12166 | -0.06853 | -0.04069 | -0.01556 |
| 22 | 0.02464 | 0.05597 | -0.16913 | 0.02583 | -0.11400 |
| 23 | 0.02502 | 0.00982 | -0.26690 | 0.09225 | -0.21004 |
| 24 | 0.02531 | 0.07568 | -0.36253 | 0.15860 | -0.30435 |
| 25 | 0.02551 | 0.14161 | -0.45665 | 0.22488 | -0.39756 |
| 26 | 0.02559 | 0.20767 | -0.54968 | 0.29102 | -0.49010 |
| 27 | 0.02551 | 0.27398 | -0.64193 | 0.35692 | -0.58240 |
| 28 | 0.02514 | 0.34071 | -0.73353 | 0.42241 | -0.67474 |
| 29 | 0.02440 | 0.40803 | -0.82449 | 0.48730 | -0.76741 |
| 30 | 0.02328 | 0.47595 | -0.91497 | 0.55155 | -0.86053 |
| 31 | 0.02181 | 0.54442 | -1.00514 | 0.61533 | -0.95418 |
| 32 | 0.02003 | 0.61341 | -1.09511 | 0.67855 | -1.04839 |
| 33 | 0.01793 | 0.68290 | -1.18494 | 0.74127 | -1.14315 |
| 34 | 0.01557 | 0.75287 | -1.27451 | 0.80351 | -1.23821 |
| 35 | 0.01297 | 0.82322 | -1.36358 | 0.86537 | -1.33327 |
| 36 | 0.01017 | 0.89389 | -1.45206 | 0.92691 | -1.42821 |
| 37 | 0.00772 | 0.95299 | -1.52528 | 0.97798 | -1.50712 |
| 38 | 0.00520 | 1.00558 | -1.58966 | 1.02326 | -1.57668 |
| 39 | 0.00220 | 1.01203 | 1.59348 | 1.02497 | -1.58405 |
| 40 | 0.00000 | 1.02058 | -1.59154 | 1.02058 | -1.59154 |
| IF RAD | 0.01013 | CENTER AT ALPHA | -1.17717 | UPSILON | 1.74200 |
| IF RAD | 0.01099 | CENTER AT ALPHA | 1.01407 | UPSILON | -1.58269 |

PHASE III ROTOR

•ZPC•

| | | | | | | | | |
|------------------------------|----|------------|--------------------|--------|--------|----------|-----|---|
| COORD SYSTEM ORIGIN | 7 | -7.04880 | R | O. | MU | O. | ETA | O |
| STAGE | 3. | ROTOR | | | NP | 20 | | |
| SECTION NO | 2 | SECTION RR | | | RRD | 8.0000 | | |
| CMBR | 4 | 0029 | STAGGER | 56.601 | CAMBER | 1.738 | | |
| AREA | O | 292919 | SURFACE ARC LENGTH | | | 8.03668 | | |
| SECTION C.G. | | | ALPHA | | | UPSILON | | |
| SURFACE SURFACE SECTION C.G. | | | -0.03382 | | | -0.06230 | | |
| BLADE AXIS | | | -0.03811 | | | -0.05345 | | |
| LIFTING AXIS (RADIAL) | | | -0.03811 | | | -0.05345 | | |
| | | | -0.00210 | | | O. | | |

PHASE III ROTOR

•7DC•

STAGE 3. ROTOR MR 20
 COORD SYSTEM ORIGIN Z -7.04880 R 0. MU 0. FTA 0.
 SECTION NO 3 SECTION CC RMD 7.5000

MEANLINE INPUT DATA

| PT | ALPHA | ZETA* | THICKNESS | UPSILON |
|----|----------|--------|-----------|----------|
| 1 | 1.28692 | 53.725 | 0.02050 | 1.71011 |
| 2 | 1.23010 | 54.079 | 0.02612 | 1.63218 |
| 3 | 1.11510 | 54.726 | 0.03748 | 1.47150 |
| 4 | -0.99843 | 55.307 | 0.04886 | 1.30456 |
| 5 | -0.88005 | 55.887 | 0.06006 | 1.13165 |
| 6 | 0.74805 | 56.600 | 0.07196 | 0.93406 |
| 7 | 0.60198 | 57.036 | 0.08410 | 0.71034 |
| 8 | -0.45414 | 56.422 | 0.09500 | 0.48440 |
| 9 | 0.30497 | 54.692 | 0.10428 | 0.26627 |
| 10 | 0.15487 | 52.303 | 0.11167 | 0.06337 |
| 11 | 0.00448 | 50.467 | 0.11700 | 0.12437 |
| 12 | 0.14591 | 49.625 | 0.12015 | 0.30355 |
| 13 | 0.29610 | 49.136 | 0.12106 | -0.47851 |
| 14 | 0.44561 | 48.788 | 0.11701 | -0.65023 |
| 15 | 0.59419 | 48.560 | 0.10625 | -0.81929 |
| 16 | 0.74166 | 48.415 | 0.08957 | -0.98595 |
| 17 | 0.88757 | 48.284 | 0.06815 | -1.15027 |
| 18 | 1.03189 | 47.954 | 0.04351 | -1.31164 |
| 19 | 1.15068 | 47.482 | 0.02171 | -1.44288 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AT | T/C | ALPHA | UPSILON | ZETA* |
|----|--------|---------|----------|---------|--------|
| 1 | 0 | 0.00514 | 1.28692 | 1.71011 | 53.725 |
| 2 | 0.0250 | 0.00666 | -1.22598 | 1.62650 | 54.095 |
| 3 | 0.0500 | 0.00817 | 1.16504 | 1.54177 | 54.452 |
| 4 | 0.0750 | 0.00968 | -1.10410 | 1.45593 | 54.806 |
| 5 | 0.1000 | 0.01117 | -1.04316 | 1.36899 | 55.125 |
| 6 | 0.1250 | 0.01265 | 0.98222 | 1.28110 | 55.399 |
| 7 | 0.1500 | 0.01410 | -0.92128 | 1.19230 | 55.686 |
| 8 | 0.1750 | 0.01553 | 0.86034 | 1.10248 | 56.006 |
| 9 | 0.2000 | 0.01692 | -0.79940 | 1.01155 | 56.331 |
| 10 | 0.2250 | 0.01853 | -0.72627 | 0.90097 | 56.708 |
| 11 | 0.2500 | 0.02007 | 0.65314 | 0.78905 | 56.940 |
| 12 | 0.2750 | 0.02153 | -0.58002 | 0.67553 | 56.981 |
| 13 | 0.3000 | 0.02291 | -0.50689 | 0.56438 | 56.756 |
| 14 | 0.3250 | 0.02418 | -0.43376 | 0.45382 | 56.230 |
| 15 | 0.3500 | 0.02535 | 0.36063 | 0.34598 | 55.444 |
| 16 | 0.3750 | 0.02641 | 0.28750 | 0.24176 | 54.398 |
| 17 | 0.4000 | 0.02735 | -0.21438 | 0.14173 | 53.255 |

PLATE III ROTOR

COORD SYSTEM ORIGIN 2 7.04880 R O. MU O. EIA O.
STAGE 3. ROTOR NR 20

SECTION NO 3 SECTION CC RIK 7.5000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PT AL | T/C | ALPHA | UPSILON | ZETA |
|----|--------|---------|----------|----------|--------|
| 18 | 0.4700 | 0.02816 | -0.14125 | 0.04581 | 52.097 |
| 19 | 0.5000 | 0.02886 | 0.06812 | -0.04639 | 51.108 |
| 20 | 0.5300 | 0.02942 | 0.00501 | -0.13585 | 50.409 |
| 21 | 0.5600 | 0.02985 | 0.07814 | -0.22347 | 49.921 |
| 22 | 0.5900 | 0.03017 | 0.15127 | -0.30984 | 49.591 |
| 23 | 0.6200 | 0.03037 | 0.22439 | -0.39536 | 49.346 |
| 24 | 0.6500 | 0.03037 | 0.29752 | 0.48018 | 49.125 |
| 25 | 0.6800 | 0.03007 | 0.37065 | -0.56439 | 48.942 |
| 26 | 0.7100 | 0.02938 | 0.44378 | 0.64813 | 48.807 |
| 27 | 0.7400 | 0.02827 | 0.51691 | -0.73152 | 48.696 |
| 28 | 0.7700 | 0.02676 | 0.59004 | 0.81459 | 48.584 |
| 29 | 0.8000 | 0.02487 | 0.66316 | -0.89734 | 48.492 |
| 30 | 0.8300 | 0.02265 | 0.73629 | 0.97900 | 48.448 |
| 31 | 0.8600 | 0.02011 | 0.80942 | -1.06236 | 48.409 |
| 32 | 0.8900 | 0.01730 | 0.88255 | -1.14463 | 48.318 |
| 33 | 0.9200 | 0.01427 | 0.95568 | -1.22659 | 48.199 |
| 34 | 0.9500 | 0.01106 | 1.02880 | -1.30821 | 48.082 |
| 35 | 0.9700 | 0.00828 | 1.08974 | 1.37590 | 47.890 |
| 36 | 1.0000 | 0.00545 | 1.15068 | -1.44288 | 47.482 |

CHORD 3 0.854 STAGGER 52.292 CAMBER 6.243

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | T/C | ALPHA | UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------|---------|-------------|---------|
| 1 | 0.00514 | 1.28692 | 1.71011 | -1.28692 | 1.71011 |
| 2 | 0.00514 | -1.29117 | 1.70281 | -1.27858 | 1.71194 |
| 3 | 0.00514 | -1.28937 | 1.69561 | -1.27236 | 1.70808 |
| 4 | 0.00656 | -1.23673 | 1.61872 | -1.21524 | 1.63428 |
| 5 | 0.00817 | -1.17829 | 1.53231 | -1.15180 | 1.55124 |
| 6 | 0.00968 | -1.11986 | 1.44482 | -1.08835 | 1.46704 |
| 7 | 0.01117 | -1.06143 | 1.35626 | -1.02490 | 1.38172 |
| 8 | 0.01265 | -1.00297 | 1.26678 | -0.96147 | 1.29541 |
| 9 | 0.01410 | -0.94449 | 1.17645 | -0.89807 | 1.20814 |
| 10 | 0.01553 | -0.88600 | 1.08518 | -0.83469 | 1.11978 |
| 11 | 0.01692 | -0.82746 | 0.99286 | -0.77135 | 1.03024 |
| 12 | 0.01853 | 0.75714 | 0.88070 | -0.69541 | 0.92124 |
| 13 | 0.02007 | 0.68666 | 0.76723 | -0.61962 | 0.81086 |
| 14 | 0.02153 | 0.61600 | 0.65315 | -0.54404 | 0.69991 |

PHASE III ROTOR

•7PC•

COORD SYSTEM ORIGIN 7 -7.04880 R 0 MU 0. FTA 0.
 SECTION NO 3 SECTION CC RWD 7.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | T/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|--------|---------|-----------------|---------------|-------------|----------|
| 15 | 0 02291 | -0.54506 | 0.53336 | -0.46871 | 0.58941 |
| 16 | 0 02418 | -0.47382 | 0.42704 | -0.39370 | 0.48061 |
| 17 | 0 02535 | -0.40224 | 0.31732 | -0.31903 | 0.37463 |
| 18 | 0 02641 | -0.33029 | 0.21113 | -0.24472 | 0.27239 |
| 19 | 0 02735 | -0.25804 | 0.10913 | -0.17071 | 0.17433 |
| 20 | 0 02816 | -0.18553 | 0.01133 | -0.09696 | 0.08029 |
| 21 | 0 02886 | -0.11288 | -0.08250 | -0.02336 | 0.01029 |
| 22 | 0 02942 | -0.04017 | -0.17322 | 0.05019 | -0.09849 |
| 23 | 0 02985 | 0.03262 | -0.26177 | 0.12365 | -0.18518 |
| 24 | 0 03017 | 0.10549 | -0.34880 | 0.19704 | -0.27087 |
| 25 | 0 03037 | 0.17848 | -0.43479 | 0.27031 | -0.35532 |
| 26 | 0 03037 | 0.25176 | 0.51978 | 0.34329 | -0.44057 |
| 27 | 0 03037 | 0.32547 | -0.60374 | 0.41583 | -0.52504 |
| 28 | 0 02938 | 0.39972 | -0.68669 | 0.48784 | -0.60957 |
| 29 | 0 02827 | 0.47459 | -0.76871 | 0.55923 | -0.69433 |
| 30 | 0 02676 | 0.55005 | -0.84986 | 0.63002 | -0.77931 |
| 31 | 0 02487 | 0.62604 | -0.93019 | 0.70028 | -0.86449 |
| 32 | 0 02265 | 0.70251 | -1.00984 | 0.77007 | -0.94996 |
| 33 | 0 02011 | 0.77945 | -1.08896 | 0.83939 | -1.03576 |
| 34 | 0 01730 | 0.85680 | -1.16756 | 0.90830 | -1.12171 |
| 35 | 0 01427 | 0.93448 | -1.24554 | 0.97687 | -1.20764 |
| 36 | 0 01105 | 1.01241 | -1.32293 | 1.04520 | -1.29349 |
| 37 | 0 00828 | 1.07751 | -1.38696 | 1.10198 | -1.36484 |
| 38 | 0 00545 | 1.13486 | -1.44268 | 1.15188 | -1.42712 |
| 39 | 0 00345 | 1.14201 | -1.44588 | 1.15443 | -1.43461 |
| 40 | 0 00145 | 1.15068 | -1.44288 | 1.15068 | -1.44288 |
| IF RAD | 0 01055 | CENTER AT ALPHA | -1.28068 | UPSILON | 1.70160 |
| IF RAD | 0 01155 | CENTER AT ALPHA | 1.14288 | UPSILON | 1.43436 |

PHASE III ROTOR

•ZINC•

| | | | | | | | | | | |
|------------------------|----------|--------------------|---|----|----|----|----------|----|------|----|
| COORD SYSTEM ORIGIN | 7 | -7.04880 | R | O. | MU | O. | NR | 20 | ETA | O. |
| SECTION NO | 3 | SECTION CC | | | | | RHO | 7 | 5000 | |
| CHORD | 1.0854 | STAGGER | | | | | CAMBER | | | |
| | | 52.242 | | | | | 6.243 | | | |
| AREA | 0.335802 | SURFACE ARC LENGTH | | | | | 8.01178 | | | |
| SECTION C.G. | | ALPHA | | | | | UPSTILON | | | |
| SURFACE SECTION C.G. | | -0.03082 | | | | | 0.03288 | | | |
| BLADE AXIS | | -0.04129 | | | | | -0.02354 | | | |
| STACKING AXIS (RADIAL) | | -0.04129 | | | | | -0.02354 | | | |
| | | -0.00210 | | | | | 0. | | | |

PHASE III ROTOR

•710•

COORD SYSTEM ORIGIN Z -7.04880 R O. MF O. ETA O.
 STAGE 3. ROTOR MC 20
 SECTION NO 4 SECTION DD RHO 7.0000

MEANLINE INPUT DATA

| PT | ALPHA | ZETA* | THICKNESS | UPSILON |
|----|----------|--------|-----------|----------|
| 1 | 1.37691 | 52.302 | 0.02080 | 1.64201 |
| 2 | 1.31555 | 52.631 | 0.02793 | 1.56218 |
| 3 | 1.19150 | 53.255 | 0.04253 | 1.39807 |
| 4 | -1.06587 | 53.832 | 0.05737 | 1.22813 |
| 5 | 0.93870 | 54.337 | 0.07218 | 1.05251 |
| 6 | 0.79704 | 54.720 | 0.08808 | 0.85352 |
| 7 | 0.64047 | 54.326 | 0.10444 | 0.63293 |
| 8 | 0.48222 | 52.256 | 0.11922 | 0.41956 |
| 9 | 0.32259 | 49.469 | 0.13184 | 0.22340 |
| 10 | 0.16192 | 47.440 | 0.14192 | 0.04257 |
| 11 | -0.00073 | 46.093 | 0.14906 | -0.12872 |
| 12 | 0.16090 | 45.089 | 0.15313 | -0.29360 |
| 13 | 0.32253 | 44.254 | 0.15360 | -0.45335 |
| 14 | 0.48404 | 43.538 | 0.14650 | -0.60878 |
| 15 | 0.64532 | 42.919 | 0.13138 | -0.76033 |
| 16 | 0.80597 | 42.342 | 0.10922 | -0.90826 |
| 17 | 0.96608 | 41.780 | 0.08146 | -1.05272 |
| 18 | 1.12538 | 41.260 | 0.04984 | -1.19371 |
| 19 | 1.25746 | 40.862 | 0.02193 | -1.30895 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AT | T/C | ALPHA | UPSILON | ZETA* |
|----|--------|---------|----------|---------|--------|
| 1 | 0 | 0.00526 | -1.37691 | 1.64201 | 52.302 |
| 2 | 0.0250 | 0.00719 | -1.31105 | 1.55629 | 52.630 |
| 3 | 0.0500 | 0.00915 | -1.24519 | 1.46955 | 52.954 |
| 4 | 0.0750 | 0.01111 | -1.17933 | 1.38177 | 53.282 |
| 5 | 0.1000 | 0.01308 | -1.11347 | 1.29296 | 53.601 |
| 6 | 0.1250 | 0.01505 | -1.04761 | 1.20312 | 53.904 |
| 7 | 0.1500 | 0.01699 | -0.98175 | 1.11233 | 54.177 |
| 8 | 0.1750 | 0.01891 | -0.91590 | 1.02058 | 54.416 |
| 9 | 0.2000 | 0.02079 | -0.85004 | 0.92829 | 54.608 |
| 10 | 0.2300 | 0.02298 | -0.77101 | 0.81670 | 54.756 |
| 11 | 0.2600 | 0.02508 | -0.69197 | 0.70504 | 54.600 |
| 12 | 0.2900 | 0.02709 | -0.61294 | 0.59479 | 54.067 |
| 13 | 0.3200 | 0.02897 | -0.53391 | 0.48746 | 53.127 |
| 14 | 0.3500 | 0.03073 | -0.45488 | 0.38454 | 51.770 |
| 15 | 0.3800 | 0.03233 | 0.37585 | 0.28671 | 50.375 |
| 16 | 0.4100 | 0.03378 | 0.29682 | 0.19344 | 49.092 |
| 17 | 0.4400 | 0.03507 | -0.21779 | 0.10399 | 48.023 |

PHASE III ROTOR

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O. EIA O.
SECTION NO 4 SECTION DD RND 7.0000

MEAN INF COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | I/C | AI | T/C | ALPHA | UPSTILON | ZETA |
|----|-----|-------|---------|----------|----------|--------|
| 18 | 0 | 4700 | 0.03618 | 0.13876 | 0.01744 | 47.218 |
| 19 | 0 | 5000 | 0.03711 | -0.05973 | -0.06694 | 46.546 |
| 20 | 0 | 5300 | 0.03785 | 0.01930 | -0.14949 | 45.961 |
| 21 | 0 | 5600 | 0.03840 | 0.09834 | -0.23047 | 45.445 |
| 22 | 0 | 5900 | 0.03878 | 0.17737 | -0.31010 | 44.994 |
| 23 | 0 | 6200 | 0.03896 | 0.25640 | -0.38854 | 44.584 |
| 24 | 0 | 6500 | 0.03876 | 0.33543 | -0.46592 | 44.206 |
| 25 | 0 | 6800 | 0.03807 | 0.41446 | -0.54230 | 43.847 |
| 26 | 0 | 7100 | 0.03686 | 0.49349 | -0.61776 | 43.501 |
| 27 | 0 | 7400 | 0.03518 | 0.57252 | -0.69233 | 43.181 |
| 28 | 0 | 7700 | 0.03303 | 0.65155 | -0.76612 | 42.898 |
| 29 | 0 | 8000 | 0.03044 | 0.73058 | -0.83921 | 42.625 |
| 30 | 0 | 8300 | 0.02746 | 0.80961 | -0.91158 | 42.338 |
| 31 | 0 | 8600 | 0.02414 | 0.88865 | -0.98323 | 42.047 |
| 32 | 0 | 8900 | 0.02052 | 0.96768 | -1.05414 | 41.758 |
| 33 | 0 | 9200 | 0.01665 | 1.04671 | -1.12437 | 41.499 |
| 34 | 0 | 9500 | 0.01258 | 1.12574 | -1.19403 | 41.297 |
| 35 | 0 | 9750 | 0.00909 | 1.19160 | -1.25171 | 41.116 |
| 36 | 0 | 10000 | 0.00554 | 1.25746 | -1.30895 | 40.862 |

CHORD 3 9558 STAGGER 48.244 CAMBER 11.440

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | I/C | ALPHA | UPPER | UPSTILON | LOWER | ALPHA | UPSTILON |
|----|-----|-------|----------|----------|----------|---------|----------|
| 1 | 0 | 00526 | -1.37691 | 1.64201 | -1.37691 | 1.64201 | |
| 2 | 0 | 00526 | -1.38105 | 1.63448 | -1.36848 | 1.64410 | |
| 3 | 0 | 00526 | -1.37908 | 1.62721 | -1.36204 | 1.64037 | |
| 4 | 0 | 00719 | -1.32236 | 1.54765 | -1.29974 | 1.56492 | |
| 5 | 0 | 00915 | -1.25963 | 1.45865 | -1.23075 | 1.48045 | |
| 6 | 0 | 01111 | -1.19695 | 1.36863 | -1.16171 | 1.39492 | |
| 7 | 0 | 01308 | -1.13430 | 1.27760 | -1.09264 | 1.30831 | |
| 8 | 0 | 01505 | -1.07166 | 1.18559 | -1.02357 | 1.22066 | |
| 9 | 0 | 01699 | -1.00900 | 1.09266 | -0.95451 | 1.13200 | |
| 10 | 0 | 01891 | 0.94631 | 0.99892 | -0.88548 | 1.04244 | |
| 11 | 0 | 02079 | -0.88355 | 0.90448 | -0.81652 | 0.95210 | |
| 12 | 0 | 02298 | -0.80812 | 0.79047 | -0.73389 | 0.84292 | |
| 13 | 0 | 02509 | 0.73242 | 0.67630 | -0.65153 | 0.73378 | |
| 14 | 0 | 02709 | -0.65632 | 0.56334 | -0.56956 | 0.62623 | |

• 304 •

| SECTION NO | SECTION DO | RHD |
|------------|------------|--------|
| 4 | 00 | 7.0000 |

RIN 7.0000

RIN 7.0000

• 288 •

80

PHASE III ROTOR

700.

COORD SYSTEM ORIGIN Z -7 04880 R O. MU O. EIA O.
 SECTION NO 5 SECTION EE RMD 6.5000

MEANLINE INPUT DATA

| PI | ALPHA | ZETA | THICKNESS | UPSILON |
|----|----------|--------|-----------|----------|
| 1 | 1.45376 | 51.274 | 0.02071 | 1.55213 |
| 2 | 1.38873 | 51.624 | 0.03018 | 1.47038 |
| 3 | 1.25732 | 52.244 | 0.04963 | 1.30241 |
| 4 | 1.12445 | 52.631 | 0.06946 | 1.12922 |
| 5 | -0.98991 | 52.627 | 0.08924 | 0.95278 |
| 6 | 0.84015 | 52.052 | 0.11042 | 0.75831 |
| 7 | 0.67497 | 50.547 | 0.13217 | 0.55146 |
| 8 | 0.50800 | 48.013 | 0.15175 | 0.35692 |
| 9 | 0.33977 | 45.176 | 0.16846 | 0.17915 |
| 10 | -0.17048 | 42.905 | 0.18175 | 0.01586 |
| 11 | 0.00045 | 41.181 | 0.19124 | -0.13718 |
| 12 | 0.17012 | 39.813 | 0.19665 | -0.28265 |
| 13 | 0.34127 | 38.652 | 0.19641 | -0.42228 |
| 14 | 0.51260 | 37.606 | 0.18622 | -0.55679 |
| 15 | 0.68425 | 36.627 | 0.16631 | -0.68671 |
| 16 | 0.85594 | 35.660 | 0.13767 | -0.81225 |
| 17 | 1.02784 | 34.682 | 0.10174 | -0.93352 |
| 18 | 1.19987 | 33.660 | 0.06023 | 1.05039 |
| 19 | 1.34343 | 32.767 | 0.02276 | 1.14459 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | PCT AI | 1/C | ALPHA | UPSILON | ZETA |
|----|--------|---------|----------|---------|--------|
| 1 | 0 | 0.00533 | -1.45376 | 1.55213 | 51.274 |
| 2 | 0.0250 | 0.00795 | -1.38383 | 1.46418 | 51.694 |
| 3 | 0.0500 | 0.01061 | -1.31390 | 1.37517 | 51.998 |
| 4 | 0.0750 | 0.01329 | -1.24397 | 1.28514 | 52.328 |
| 5 | 0.1000 | 0.01598 | -1.17405 | 1.19414 | 52.572 |
| 6 | 0.1250 | 0.01865 | -1.10412 | 1.10255 | 52.679 |
| 7 | 0.1500 | 0.02131 | -1.03419 | 1.01080 | 52.678 |
| 8 | 0.1750 | 0.02392 | -0.96426 | 0.91922 | 52.577 |
| 9 | 0.2000 | 0.02648 | -0.89433 | 0.82817 | 52.342 |
| 10 | 0.2250 | 0.02946 | -0.81041 | 0.72030 | 51.861 |
| 11 | 0.2500 | 0.03233 | -0.72649 | 0.61473 | 51.127 |
| 12 | 0.2750 | 0.03505 | -0.64258 | 0.51241 | 50.116 |
| 13 | 0.3000 | 0.03760 | -0.55865 | 0.41409 | 48.877 |
| 14 | 0.3250 | 0.03997 | -0.47475 | 0.32034 | 47.430 |
| 15 | 0.3500 | 0.04214 | -0.39083 | 0.23126 | 46.000 |
| 16 | 0.3750 | 0.04409 | -0.30691 | 0.14638 | 44.669 |
| 17 | 0.4000 | 0.04582 | -0.22300 | 0.06514 | 43.503 |

PHASE III ROTOR

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O. ETA O.
SECTION NO 5 SECTION FE WIND 6.5000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | PCT AT | T/C | ALPHA | UPSILON | 7FIA |
|----|--------|---------|----------|----------|--------|
| 18 | 0.4700 | 0.04730 | -0.13908 | -0.01312 | 42.528 |
| 19 | 0.5000 | 0.04855 | -0.05517 | -0.08892 | 41.670 |
| 20 | 0.5300 | 0.04954 | 0.02875 | -0.16260 | 40.911 |
| 21 | 0.5600 | 0.05027 | 0.11266 | -0.23443 | 40.224 |
| 22 | 0.5900 | 0.05072 | 0.19658 | -0.30462 | 39.603 |
| 23 | 0.6200 | 0.05082 | 0.28050 | -0.37334 | 39.034 |
| 24 | 0.6500 | 0.05036 | 0.36441 | -0.44074 | 38.513 |
| 25 | 0.6800 | 0.04922 | 0.44833 | -0.50691 | 38.006 |
| 26 | 0.7100 | 0.04746 | 0.53224 | 0.57190 | 37.501 |
| 27 | 0.7400 | 0.04512 | 0.61616 | -0.63572 | 37.016 |
| 28 | 0.7700 | 0.04221 | 0.70008 | -0.69847 | 36.557 |
| 29 | 0.8000 | 0.03877 | 0.78399 | -0.76017 | 36.099 |
| 30 | 0.8300 | 0.03484 | 0.86791 | -0.82084 | 35.628 |
| 31 | 0.8600 | 0.03047 | 0.95182 | -0.88045 | 35.143 |
| 32 | 0.8900 | 0.02572 | 1.03574 | -0.93898 | 34.643 |
| 33 | 0.9200 | 0.02063 | 1.11965 | -0.99643 | 34.154 |
| 34 | 0.9500 | 0.01526 | 1.20357 | -1.05286 | 33.693 |
| 35 | 0.9700 | 0.01060 | 1.27350 | -1.09913 | 33.273 |
| 36 | 1.0000 | 0.00586 | 1.34343 | -1.14459 | 32.767 |

STAGGER 43.952
CAMBER 18.508

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | T/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------|---------------|-------------|---------|
| 1 | 0.00533 | -1.45376 | 1.55213 | -1.45376 | 1.55213 |
| 2 | 0.00533 | -1.45780 | 1.54453 | -1.44537 | 1.55437 |
| 3 | 0.00533 | -1.45576 | 1.53729 | -1.43885 | 1.55080 |
| 4 | 0.00705 | -1.39596 | 1.45460 | -1.37171 | 1.47376 |
| 5 | 0.01061 | -1.33014 | 1.36249 | -1.29767 | 1.38786 |
| 6 | 0.01329 | -1.26441 | 1.26937 | -1.22354 | 1.30092 |
| 7 | 0.01598 | -1.19869 | 1.17527 | -1.14940 | 1.21300 |
| 8 | 0.01865 | -1.13294 | 1.08058 | -1.07529 | 1.12453 |
| 9 | 0.02131 | -1.06710 | 0.98571 | -1.00127 | 1.03540 |
| 10 | 0.02392 | -1.00116 | 0.89098 | -0.92735 | 0.94746 |
| 11 | 0.02648 | 0.93505 | 0.79674 | -0.85360 | 0.85960 |
| 12 | 0.02904 | 0.85543 | 0.68415 | -0.76839 | 0.75565 |
| 13 | 0.03233 | -0.77539 | 0.57532 | -0.67760 | 0.65415 |
| 14 | 0.03505 | -0.69482 | 0.46875 | -0.59033 | 0.55607 |

PHASE III ROTOR

7PC.

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O. ETA O.

SECTION NO 5 SECTION EE RHO 6.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| P1 | T/C | ALPHA | UPPER | UPSTION | LOWER | UPSTION |
|--------|---------|-----------------|----------|---------|----------|----------|
| | | | | | ALPHA | |
| 15 | 0 03750 | -0.61369 | 0.36605 | | -0.50363 | 0.46214 |
| 16 | 0 03997 | -0.53193 | 0.26781 | | -0.41756 | 0.37288 |
| 17 | 0 04214 | -0.44972 | 0.17439 | | -0.33194 | 0.28813 |
| 18 | 0 04409 | -0.36714 | 0.08546 | | -0.24669 | 0.20730 |
| 19 | 0 04582 | -0.28427 | 0.00058 | | -0.16172 | 0.12970 |
| 20 | 0 04730 | -0.20120 | -0.08084 | | -0.07696 | 0.05461 |
| 21 | 0 04855 | -0.11787 | 0.15937 | | 0.00753 | 0.01847 |
| 22 | 0 04954 | -0.03428 | -0.23533 | | 0.09177 | -0.08987 |
| 23 | 0 05027 | 0.04960 | -0.30900 | | 0.17573 | -0.15987 |
| 24 | 0 05072 | 0.13376 | -0.38054 | | 0.25940 | -0.22869 |
| 25 | 0 05082 | 0.21832 | 0.45003 | | 0.34267 | -0.29665 |
| 26 | 0 05036 | 0.30350 | 0.51729 | | 0.42533 | -0.36419 |
| 27 | 0 04922 | 0.38945 | -0.58226 | | 0.50721 | -0.43156 |
| 28 | 0 04746 | 0.47611 | -0.64505 | | 0.58838 | -0.49874 |
| 29 | 0 04512 | 0.56339 | -0.70571 | | 0.66893 | -0.56573 |
| 30 | 0 04221 | 0.65123 | -0.76434 | | 0.74892 | -0.63259 |
| 31 | 0 03877 | 0.73961 | -0.82104 | | 0.82837 | -0.69931 |
| 32 | 0 03484 | 0.82848 | 0.87586 | | 0.90734 | -0.76582 |
| 33 | 0 03047 | 0.91774 | -0.92886 | | 0.98590 | -0.83204 |
| 34 | 0 02572 | 1.00733 | -0.98009 | | 1.06414 | -0.89787 |
| 35 | 0 02063 | 1.09715 | -1.02960 | | 1.14216 | -0.96325 |
| 36 | 0 01526 | 1.18713 | -1.07753 | | 1.22001 | -1.02820 |
| 37 | 0 01060 | 1.26220 | -1.11635 | | 1.28480 | -1.08191 |
| 38 | 0 00586 | 1.32707 | -1.14908 | | 1.34078 | -1.12784 |
| 39 | 0 00086 | 1.33528 | -1.15016 | | 1.34518 | -1.13503 |
| 40 | 0 00586 | 1.34343 | -1.14459 | | 1.34343 | -1.14459 |
| IF RAD | 0 01083 | CENTER AT ALPHA | -1.44700 | | UPSTION | 1.54366 |
| IE RAD | 0 01272 | CENTER AT ALPHA | 1.33274 | | UPSTION | -1.13770 |

4700.

PHASE III ROTOR

| | | | | |
|------------------------|----------|--------------------|----------|--------|
| COORD SYSTEM ORIGIN Z | 7.04880 | R O. | MU O | ETA O |
| STAGE | 3 | ROTOR | NR | 20 |
| SECTION NO | 5 | SECTION EE | RND | 6.5000 |
| CHORD | 3.8854 | STAGGER | CAMBER | |
| | | 43.952 | 18.508 | |
| AREA | 0.506647 | SURFACE ARC LENGTH | 7.86397 | |
| SECTION C.G. | | ALPHA | UPSILON | |
| SURFACE | | -0.03211 | -0.03877 | |
| SECTION C.G. | | -0.06264 | -0.02788 | |
| BLADE AXIS | | 0.06264 | 0.02788 | |
| TRACKING AXIS (RADIAL) | | -0.00210 | 0. | |

PIA-3 111 ROTOR

•ZPC•

COORD SYSTEM ORIGIN 7 -7.04880 R 0.0 MJ 0.0 FYA 0.0
 SECTION NO 6 SECTION FF RHO 6.0000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT | AI | T/C | ALPHA | UPSILON | ZETA |
|----|-----|------|---------|----------|----------|--------|
| 18 | 0 | 4700 | 0.05841 | -0.13928 | -0.01852 | 37.346 |
| 19 | 0 | 5000 | 0.05989 | -0.05117 | -0.04463 | 36.427 |
| 20 | 0 | 5300 | 0.06106 | 0.03693 | -0.14858 | 35.526 |
| 21 | 0 | 5600 | 0.06190 | 0.12503 | -0.21046 | 34.643 |
| 22 | 0 | 5900 | 0.06231 | 0.21313 | 0.27036 | 33.781 |
| 23 | 0 | 6200 | 0.06215 | 0.30123 | -0.32837 | 32.949 |
| 24 | 0 | 6500 | 0.06128 | 0.38933 | -0.38460 | 32.150 |
| 25 | 0 | 6800 | 0.05963 | 0.47743 | -0.43913 | 31.362 |
| 26 | 0 | 7100 | 0.05726 | 0.56553 | 0.49201 | 30.580 |
| 27 | 0 | 7400 | 0.05421 | 0.65363 | 0.54326 | 29.792 |
| 28 | 0 | 7700 | 0.05051 | 0.74173 | -0.59289 | 28.992 |
| 29 | 0 | 8000 | 0.04619 | 0.82983 | -0.64089 | 28.169 |
| 30 | 0 | 8300 | 0.04132 | 0.91793 | -0.68723 | 27.317 |
| 31 | 0 | 8600 | 0.03595 | 1.00603 | -0.73188 | 26.430 |
| 32 | 0 | 8900 | 0.03013 | 1.09413 | -0.77480 | 25.503 |
| 33 | 0 | 9200 | 0.02394 | 1.18224 | -0.81590 | 24.494 |
| 34 | 0 | 9500 | 0.01741 | 1.27034 | -0.85502 | 23.377 |
| 35 | 0 | 9750 | 0.01177 | 1.34375 | 0.88604 | 22.440 |
| 36 | 1 | 0000 | 0.00602 | 1.41717 | -0.91570 | 21.562 |

CHORD 1 76.35
 STAGGER 38.824
 CAMBER 28.851

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | T/C | ALPHA | UPSILON | UPPER ALPHA | LOWER ALPHA | UPSILON |
|----|-----|-------|----------|-------------|-------------|---------|
| 1 | 0 | 00528 | -1.51952 | 1.44751 | -1.51952 | 1.44751 |
| 2 | 0 | 00528 | -1.52331 | 1.44011 | -1.51148 | 1.44984 |
| 3 | 0 | 00528 | -1.52128 | 1.43317 | -1.50510 | 1.44655 |
| 4 | 0 | 00871 | -1.45879 | 1.34800 | -1.43342 | 1.36881 |
| 5 | 0 | 01217 | -1.39047 | 1.25405 | -1.35490 | 1.28300 |
| 6 | 0 | 01564 | 1.32217 | 1.15953 | -1.27636 | 1.19665 |
| 7 | 0 | 01911 | -1.25382 | 1.06480 | -1.19788 | 1.11017 |
| 8 | 0 | 02255 | 1.18535 | 0.97036 | 1.11952 | 1.02412 |
| 9 | 0 | 02594 | -1.11670 | 0.87669 | -1.04133 | 0.93898 |
| 10 | 0 | 02927 | -1.04783 | 0.78421 | -0.96337 | 0.85516 |
| 11 | 0 | 03261 | 0.97866 | 0.69329 | 0.88570 | 0.77317 |
| 12 | 0 | 03627 | -0.89517 | 0.58689 | -0.79299 | 0.67776 |
| 13 | 0 | 03987 | 0.81104 | 0.48417 | 0.70092 | 0.58644 |
| 14 | 0 | 04327 | 0.72617 | 0.38579 | -0.61959 | 0.49988 |

PIA-111 RUTOR

COORD SYSTEM ORIGIN 7 -7.04880 R 0.00000
 SECTION NO 6 SECTION FF RHO 6.00000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCI | AI | T/C | ALPHA | UPSILON | ZETA |
|----|-----|-------|---------|----------|----------|--------|
| 18 | 0 | 4700 | 0.05841 | -0.13928 | -0.01852 | 37.346 |
| 19 | 0 | 5000 | 0.05989 | -0.05117 | -0.04463 | 36.427 |
| 20 | 0 | 5300 | 0.06106 | 0.03693 | -0.14858 | 35.526 |
| 21 | 0 | 5600 | 0.06190 | 0.12503 | -0.21046 | 34.643 |
| 22 | 0 | 5900 | 0.06231 | 0.21313 | -0.27036 | 33.781 |
| 23 | 0 | 6200 | 0.06215 | 0.30123 | -0.32837 | 32.949 |
| 24 | 0 | 6500 | 0.06128 | 0.38933 | -0.38460 | 32.150 |
| 25 | 0 | 6800 | 0.05963 | 0.47743 | -0.43913 | 31.362 |
| 26 | 0 | 7100 | 0.05726 | 0.56553 | -0.49201 | 30.580 |
| 27 | 0 | 7400 | 0.05421 | 0.65363 | -0.54326 | 29.792 |
| 28 | 0 | 7700 | 0.05051 | 0.74173 | -0.59289 | 28.992 |
| 29 | 0 | 8000 | 0.04619 | 0.82983 | -0.64089 | 28.169 |
| 30 | 0 | 8300 | 0.04132 | 0.91793 | -0.68723 | 27.317 |
| 31 | 0 | 8600 | 0.03595 | 1.00603 | -0.73188 | 26.430 |
| 32 | 0 | 8900 | 0.03013 | 1.09413 | -0.77480 | 25.503 |
| 33 | 0 | 9200 | 0.02394 | 1.18224 | -0.81590 | 24.494 |
| 34 | 0 | 9500 | 0.01741 | 1.27034 | -0.85502 | 23.377 |
| 35 | 0 | 9750 | 0.01177 | 1.34375 | -0.88604 | 22.440 |
| 36 | 1 | 10000 | 0.00602 | 1.41717 | -0.91570 | 21.562 |

CHORD 1 76.96
 STAGGER 38.824
 CAMBER 28.851

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | T/C | UPPER ALPHA | UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------------|---------|----------------|---------|
| 1 | 0.00528 | -1.51952 | 1.44751 | -1.51952 | 1.44751 |
| 2 | 0.00528 | -1.52331 | 1.44011 | -1.51148 | 1.44984 |
| 3 | 0.00528 | -1.52128 | 1.43317 | -1.50510 | 1.44655 |
| 4 | 0.00871 | -1.45879 | 1.34800 | -1.43342 | 1.36881 |
| 5 | 0.01217 | -1.39047 | 1.25405 | -1.35490 | 1.28300 |
| 6 | 0.01564 | 1.32217 | 1.15953 | -1.27636 | 1.19665 |
| 7 | 0.01911 | -1.25382 | 1.06480 | -1.19788 | 1.11017 |
| 8 | 0.02255 | 1.18535 | 0.97036 | -1.11952 | 1.02412 |
| 9 | 0.02594 | -1.11670 | 0.87669 | -1.04133 | 0.93898 |
| 10 | 0.02927 | -1.04783 | 0.78421 | -0.96337 | 0.85516 |
| 11 | 0.03261 | 0.97866 | 0.69329 | -0.88570 | 0.77313 |
| 12 | 0.03627 | -0.89517 | 0.58689 | -0.79299 | 0.67776 |
| 13 | 0.03987 | 0.81104 | 0.48417 | -0.70092 | 0.58644 |
| 14 | 0.04327 | 0.72617 | 0.38579 | -0.60959 | 0.49988 |

PHASE III ROTOR

• 2PC •

COORD SYSTEM ORIGIN Z -7.04880 R 0. MU 0. ETA 0.
STAGE 3. ROTOR NR 20
SECTION NO 6 SECTION FF RND 5.0000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| P1 | I/C | ALPHA | UPPER | UPSILON | LOWER | ALPHA | UPSILON |
|--------|---------|-----------------|-------|----------|----------|----------|----------|
| 15 | 0 04647 | -0.64060 | | 0.29229 | -0.51896 | 0.41833 | 0.41833 |
| 16 | 0 04942 | -0.55432 | | 0.20386 | -0.42904 | 0.34171 | 0.34171 |
| 17 | 0 05211 | -0.46764 | | 0.12048 | -0.33951 | 0.26334 | 0.26334 |
| 18 | 0 05451 | -0.38073 | | 0.04147 | -0.25023 | 0.20020 | 0.20020 |
| 19 | 0 05662 | -0.29353 | | 0.03388 | -0.16122 | 0.13361 | 0.13361 |
| 20 | 0 05841 | -0.20606 | | -0.10604 | -0.07249 | 0.06901 | 0.06901 |
| 21 | 0 05989 | -0.11820 | | -0.17545 | 0.01585 | 0.00618 | 0.00618 |
| 22 | 0 06106 | -0.02994 | | -0.24224 | 0.10380 | -0.05493 | -0.05493 |
| 23 | 0 06190 | 0.05871 | | -0.30645 | 0.19135 | -0.11448 | -0.11448 |
| 24 | 0 06231 | 0.14783 | | -0.36797 | 0.27842 | -0.17275 | -0.17275 |
| 25 | 0 06215 | 0.23752 | | -0.42667 | 0.36494 | -0.23007 | -0.23007 |
| 26 | 0 06128 | 0.32787 | | -0.48239 | 0.45079 | -0.28681 | -0.28681 |
| 27 | 0 05963 | 0.41893 | | -0.53511 | 0.53593 | -0.34316 | -0.34316 |
| 28 | 0 05726 | 0.51063 | | -0.58492 | 0.62043 | -0.39910 | -0.39910 |
| 29 | 0 05421 | 0.60287 | | -0.63192 | 0.70439 | -0.45460 | -0.45460 |
| 30 | 0 05051 | 0.69560 | | -0.67615 | 0.78787 | -0.50963 | -0.50963 |
| 31 | 0 04519 | 0.78873 | | -0.71764 | 0.87093 | -0.56414 | -0.56414 |
| 32 | 0 04132 | 0.88219 | | -0.75643 | 0.95367 | -0.61804 | -0.61804 |
| 33 | 0 03595 | 0.97588 | | -0.79255 | 1.03619 | -0.67122 | -0.67122 |
| 34 | 0 03013 | 1.06968 | | -0.82606 | 1.11859 | -0.72354 | -0.72354 |
| 35 | 0 02394 | 1.16353 | | -0.85696 | 1.20094 | -0.77484 | -0.77484 |
| 36 | 0 01741 | 1.25731 | | -0.88515 | 1.28336 | -0.82490 | -0.82490 |
| 37 | 0 01177 | 1.33529 | | -0.90654 | 1.35222 | -0.86554 | -0.86554 |
| 38 | 0 00602 | 1.40195 | | -0.92354 | 1.41148 | -0.89957 | -0.89957 |
| 39 | 0 00002 | 1.41015 | | 0.92288 | 1.41712 | -0.90598 | -0.90598 |
| 40 | 0 00002 | 1.41717 | | -0.91570 | 1.41717 | -0.91570 | -0.91570 |
| IF RAD | 0 01051 | CENTER AT ALPHA | | -1.51282 | UPSILON | 1.43941 | 1.43941 |
| IF RAD | 0 01302 | CENTER AT ALPHA | | 1.40507 | UPSILON | -0.91090 | -0.91090 |

PHASE III ROTOR

COORD SYSTEM ORIGIN Z 7 0480 R 0 MJ 0. FIA 0.

STAGE 3. ROTOR NR 20

SECTION NO 6 SECTION FT RND 6.0000

CURVD 3 5695 STAGGER 38.824 CAMBER 28.851

AREA 0.580286 SURFACE ARC LENGTH 7.68397

SECTION C.G. ALPHA UPSILON
 SURFACESURFACE SECTION C.G. -0.03927 -0.01718
 BLADE AXIS -0.07125 -0.01790
 STACKING AXIS (RADIAL) 0.00210 0

PHASE III ROTOR

•71°C•

COORD SYSTEM ORIGIN Z -7.04880 R 0 MU 0. ETA 0.
 STAGE 3. ROTOR NR 20
 SECTION NO 7 SECTION GG RHO 5.5000

MEANLINE INPUT DATA

| PT | ALPHA | ZETA* | THICKNESS | UPSILON |
|----|---------|--------|-----------|----------|
| 1 | 1.56840 | 49.293 | 0.01886 | 1.32753 |
| 2 | 1.49634 | 49.264 | 0.03326 | 1.24356 |
| 3 | 1.35082 | 48.979 | 0.06249 | 1.07497 |
| 4 | 1.20357 | 48.313 | 0.09183 | 0.90726 |
| 5 | 1.05466 | 47.083 | 0.12074 | 0.74321 |
| 6 | 0.88936 | 44.678 | 0.15132 | 0.57199 |
| 7 | 0.70743 | 41.121 | 0.18225 | 0.40284 |
| 8 | 0.52434 | 38.011 | 0.20952 | 0.25199 |
| 9 | 0.34035 | 35.568 | 0.23205 | 0.11456 |
| 10 | 0.15562 | 33.209 | 0.24910 | 0.01186 |
| 11 | 0.02968 | 30.817 | 0.26013 | -0.12785 |
| 12 | 0.21560 | 28.477 | 0.26456 | -0.23385 |
| 13 | 0.40208 | 26.271 | 0.25837 | 0.33078 |
| 14 | 0.58902 | 24.019 | 0.24067 | -0.41923 |
| 15 | 0.77666 | 21.452 | 0.21240 | -0.49878 |
| 16 | 0.96502 | 18.332 | 0.17454 | -0.56805 |
| 17 | 1.15395 | 14.373 | 0.12792 | -0.62462 |
| 18 | 1.34358 | 9.329 | 0.07312 | -0.66460 |
| 19 | 1.50177 | 4.166 | 0.02184 | -0.68205 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | P.C.T AL | T/C | ALPHA | UPSILON | ZETA* |
|----|----------|---------|----------|---------|--------|
| 1 | 0 | 0.00514 | 1.56840 | 1.32753 | 49.293 |
| 2 | 0.0250 | 0.00932 | 1.49165 | 1.23809 | 49.358 |
| 3 | 0.0400 | 0.01352 | 1.41489 | 1.14893 | 49.186 |
| 4 | 0.0750 | 0.01772 | 1.33814 | 1.06037 | 48.972 |
| 5 | 0.1000 | 0.02190 | 1.26138 | 0.97262 | 48.659 |
| 6 | 0.1250 | 0.02604 | 1.18463 | 0.88603 | 48.211 |
| 7 | 0.1500 | 0.03012 | 1.10787 | 0.80100 | 47.610 |
| 8 | 0.1750 | 0.03412 | 1.03112 | 0.71800 | 46.834 |
| 9 | 0.2000 | 0.03802 | -0.95437 | 0.63757 | 45.794 |
| 10 | 0.2300 | 0.04255 | -0.86226 | 0.54545 | 44.143 |
| 11 | 0.2600 | 0.04687 | -0.77016 | 0.45879 | 42.350 |
| 12 | 0.2900 | 0.05094 | -0.67805 | 0.37745 | 40.550 |
| 13 | 0.3200 | 0.05474 | -0.58595 | 0.30092 | 38.932 |
| 14 | 0.3500 | 0.05821 | -0.49384 | 0.22834 | 37.576 |
| 15 | 0.3800 | 0.06135 | -0.40174 | 0.15906 | 36.334 |
| 16 | 0.4100 | 0.06412 | -0.30963 | 0.09277 | 35.158 |
| 17 | 0.4400 | 0.06651 | -0.21753 | 0.02928 | 33.996 |

PHASE III ROTOR

47PC

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O. EIA O.

SECTION NO 7 SECTION RG RHO 5.5000

MEAN LINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCI | AI | I/C | ALPHA | UPSILON | 7FIA |
|----|-----|-------|---------|----------|----------|--------|
| 18 | 0 | 4700 | 0 06849 | -0.12542 | -0.03149 | 32.834 |
| 19 | 0 | 5000 | 0.07005 | -0.03332 | -0.08960 | 31.662 |
| 20 | 0 | 5100 | 0 07122 | 0.05879 | -0.14511 | 30.481 |
| 21 | 0 | 5600 | 0 07195 | 0 15089 | -0.19807 | 29.329 |
| 22 | 0 | 5900 | 0 07205 | 0 24300 | -0.24865 | 28.223 |
| 23 | 0 | 6200 | 0 07138 | 0 33510 | -0.29698 | 27.154 |
| 24 | 0 | 6500 | 0.06994 | 0.42721 | 0.34317 | 26.117 |
| 25 | 0 | 6800 | 0.06774 | 0.51931 | 0 38728 | 25.047 |
| 26 | 0 | 7100 | 0.06482 | 0.61142 | 0.42923 | 23.917 |
| 27 | 0 | 7400 | 0 06121 | 0 70352 | -0.46893 | 22.705 |
| 28 | 0 | 7700 | 0.05696 | 0.79563 | -0.50626 | 21.397 |
| 29 | 0 | 8000 | 0.05210 | 0.88773 | -0.54103 | 19.939 |
| 30 | 0 | 8300 | 0.04665 | 0.97984 | -0.57299 | 18.299 |
| 31 | 0 | 8600 | 0.04065 | 1.07194 | 0 60184 | 16.437 |
| 32 | 0 | 8900 | 0.03412 | 1 16405 | -0.62722 | 14.325 |
| 33 | 0 | 9200 | 0.02709 | 1.25615 | -0.64865 | 11.773 |
| 34 | 0 | 9500 | 0.01953 | 1.34826 | 0.66532 | 8.645 |
| 35 | 0 | 9750 | 0.01284 | 1.42501 | 0.67520 | 6.123 |
| 36 | 1 | 10000 | 0.00595 | 1.50177 | -0.68205 | 4.166 |

CHORD 3.6594 STAGGER 33.207 CAMBER 45.126

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | I/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------|---------------|-------------|---------|
| 1 | 0.00514 | -1.56840 | 1.32753 | -1.56840 | 1.32753 |
| 2 | 0.00514 | -1.57190 | 1.32038 | -1.56083 | 1.32990 |
| 3 | 0.00514 | -1.56989 | 1.31385 | -1.55465 | 1.32692 |
| 4 | 0.00932 | -1.50462 | 1.22695 | -1.47867 | 1.24922 |
| 5 | 0.01352 | -1.43367 | 1.13271 | -1.39612 | 1.16514 |
| 6 | 0.01772 | -1.36267 | 1.03903 | -1.31361 | 1.08172 |
| 7 | 0.02190 | -1.29155 | 0.94607 | -1.23121 | 0.99916 |
| 8 | 0.02604 | -1.22025 | 0.85419 | -1.14901 | 0.91786 |
| 9 | 0.03012 | -1.14869 | 0.76375 | -1.06706 | 0.83826 |
| 10 | 0.03412 | -1.07678 | 0.67518 | -0.98546 | 0.76083 |
| 11 | 0.03802 | -1.00438 | 0.58893 | -0.90436 | 0.68621 |
| 12 | 0.04255 | -0.91663 | 0.48943 | -0.80789 | 0.60147 |
| 13 | 0.04687 | 0.82808 | 0.39525 | -0.71223 | 0.52234 |
| 14 | 0.05094 | 0.73881 | 0.30643 | -0.61729 | 0.44846 |

PHASE III ROTOR

COORD SYSTEM ORIGIN Z -7.04880 R 0. MU 0. NR 20. ETA 0.

SECTION NO 7 SECTION GG RHD 5 5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | I/C | UPPER ALPHA | UPPER UPSILON | LOWER ALPHA | LOWER UPSILON |
|--------|---------|-----------------|---------------|-------------|---------------|
| 15 | 0 05474 | -0.64905 | 0.22280 | -0.52284 | 0.37904 |
| 16 | 0 05821 | -0.55897 | 0.14369 | -0.42871 | 0.31299 |
| 17 | 0 06135 | -0.46843 | 0.06839 | -0.33505 | 0.24973 |
| 18 | 0 06412 | -0.37737 | -0.00341 | -0.24189 | 0.18995 |
| 19 | 0 06651 | -0.28575 | -0.07188 | -0.14930 | 0.13045 |
| 20 | 0 06849 | -0.19355 | -0.13707 | -0.05729 | 0.07409 |
| 21 | 0 07095 | -0.10078 | -0.19899 | 0.03414 | 0.01978 |
| 22 | 0 07122 | -0.00750 | 0.25772 | 0.12507 | -0.03249 |
| 23 | 0 07195 | 0.08623 | -0.31317 | 0.21556 | -0.09298 |
| 24 | 0 07205 | 0.18048 | -0.36513 | 0.30551 | -0.13218 |
| 25 | 0 07138 | 0.27533 | 0.41351 | 0.39487 | -0.18745 |
| 26 | 0 06794 | 0.37072 | -0.45839 | 0.48369 | -0.22796 |
| 27 | 0 06774 | 0.46670 | -0.49987 | 0.57193 | -0.27469 |
| 28 | 0 06482 | 0.56321 | 0.53794 | 0.65963 | -0.32053 |
| 29 | 0 06121 | 0.66018 | -0.57253 | 0.74687 | -0.36534 |
| 30 | 0 05696 | 0.75750 | 0.60356 | 0.83375 | -0.40896 |
| 31 | 0 05210 | 0.85514 | -0.63089 | 0.92033 | -0.45118 |
| 32 | 0 04665 | 0.95296 | -0.65426 | 1.00671 | -0.49173 |
| 33 | 0 04065 | 1.05084 | 0.67337 | 1.09305 | 0.53031 |
| 34 | 0 03412 | 1.14856 | -0.68787 | 1.17954 | -0.56656 |
| 35 | 0 02709 | 1.24601 | -0.69731 | 1.26629 | -0.59999 |
| 36 | 0 01953 | 1.34287 | -0.70074 | 1.35364 | -0.62990 |
| 37 | 0 01284 | 1.42250 | -0.69862 | 1.42752 | -0.65179 |
| 38 | 0 00595 | 1.49004 | 0.69392 | 1.49199 | -0.66860 |
| 39 | 0 00595 | 1.49718 | 0.69098 | 1.49910 | -0.67321 |
| 40 | 0 00595 | 1.50177 | -0.68205 | 1.50177 | 0.68205 |
| LE RAD | 0 01006 | CENTER AT ALPHA | -1.56185 | UPSILON | 1.31989 |
| TF RAD | 0 01287 | CENTER AT ALPHA | 1.48893 | UPSILON | -0.68110 |

PHASE III ROTOR

| | | | | | | | | | | |
|---------------------|----------|--------------------|---|---------|--------|----|--------|----|-----|---|
| COORD SYSTEM ORIGIN | Z | -7.04880 | R | 0 | MJ | 0. | MB | 20 | EIA | 0 |
| SECTION NO | 7 | SECTION | | GG | RHO | | 5.5000 | | | |
| CHORD | 3 6694 | STAGGER | | 33 207 | CAMBER | | 45.126 | | | |
| AREA | 0 640526 | SURFACE ARC LENGTH | | 7 56495 | | | | | | |

| | | |
|------------------------|----------|----------|
| SECTION C.G. | ALPHA | UPSILON |
| SURFACE SECTION C.G. | -0.02894 | -0 01024 |
| BLADE AXIS | -0.06138 | -0.02051 |
| STACKING AXIS (RADIAL) | 0.06138 | -0 02051 |
| | -0.00210 | 0 |

PHASE III ROTOR

COORD SYSTEM ORIGIN Z -7.04880 R 0. MU 0. ETA 0.

SECTION NO 8 SECTION INI RHO 5.0000

MEANLINE INPUT DATA

| PI | ALPHA | ZETA* | THICKNESS | UPSILON |
|----|----------|---------|-----------|----------|
| 1 | 1.57695 | 47.508 | 0.01945 | 1.18826 |
| 2 | 1.49990 | 47.249 | 0.03628 | 1.10464 |
| 3 | 1.74494 | 46.574 | 0.07029 | 0.93898 |
| 4 | 1.18906 | 45.397 | 0.10399 | 0.71735 |
| 5 | 1.03278 | 43.433 | 0.13651 | 0.62380 |
| 6 | -0.86065 | 40.502 | 0.16993 | 0.46865 |
| 7 | 0.67270 | 37.121 | 0.20247 | 0.31756 |
| 8 | 0.48496 | 34.145 | 0.23004 | 0.18305 |
| 9 | 0.29729 | 31.318 | 0.25231 | 0.06238 |
| 10 | 0.10981 | 28.387 | 0.26927 | -0.04517 |
| 11 | 0.07733 | 25.442 | 0.28102 | -0.14000 |
| 12 | 0.26428 | 22.490 | 0.28776 | -0.22276 |
| 13 | 0.45078 | 19.249 | 0.28627 | -0.29343 |
| 14 | 0.63654 | 15.477 | 0.27192 | -0.35093 |
| 15 | 0.82139 | 11.111 | 0.24329 | -0.39764 |
| 16 | 1.00439 | 5.998 | 0.19996 | -0.41993 |
| 17 | 1.18459 | -0.376 | 0.14758 | 0.42768 |
| 18 | 1.36003 | -8.710 | 0.07962 | -0.41423 |
| 19 | 1.50109 | -17.691 | 0.02843 | 0.38218 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | PC1 | AL | T/C | ALPHA | UPSILON | ZETA* |
|----|---------|---------|----------|---------|---------|-------|
| 1 | 0 | 0.00563 | -1.57695 | 1.18826 | 47.508 | |
| 2 | 0.0250 | 0.01049 | -1.50000 | 1.10475 | 47.200 | |
| 3 | 0.04500 | 0.01538 | 1.42305 | 1.02202 | 46.929 | |
| 4 | 0.0750 | 0.02027 | -1.34610 | 0.94020 | 46.567 | |
| 5 | 0.1000 | 0.02512 | -1.26915 | 0.85957 | 46.079 | |
| 6 | 0.1250 | 0.02990 | -1.19220 | 0.78053 | 45.424 | |
| 7 | 0.1500 | 0.03460 | -1.11525 | 0.70353 | 44.581 | |
| 8 | 0.1750 | 0.03918 | 1.03830 | 0.62903 | 43.524 | |
| 9 | 0.2000 | 0.04362 | -0.96134 | 0.55747 | 42.290 | |
| 10 | 0.2300 | 0.04873 | 0.86900 | 0.47580 | 40.654 | |
| 11 | 0.2600 | 0.05355 | -0.77666 | 0.39888 | 38.945 | |
| 12 | 0.2900 | 0.05805 | -0.68432 | 0.32639 | 37.328 | |
| 13 | 0.3200 | 0.06221 | -0.59198 | 0.25790 | 35.807 | |
| 14 | 0.3500 | 0.06600 | -0.49964 | 0.19305 | 34.369 | |
| 15 | 0.3800 | 0.06943 | 0.40730 | 0.13151 | 32.982 | |
| 16 | 0.4100 | 0.07248 | 0.31496 | 0.07318 | 31.571 | |
| 17 | 0.4400 | 0.07516 | -0.22262 | 0.01801 | 30.138 | |

PHASE 111 ROTOR

•7PC•

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O. ETA O.
SECTION NO 8 SECTION 1#1 RWD 5 0000

MEAN LINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AT | T/C | ALPHA | UPSILON | ZETA* |
|----|--------|---------|----------|----------|---------|
| 18 | 0 4700 | 0 07746 | -0.13027 | 0 03405 | 28.6R2 |
| 19 | 0 5000 | 0 07940 | 0 03793 | -0.08305 | 27.212 |
| 20 | 0 5300 | 0 08098 | 0 05441 | -0.12904 | 25.740 |
| 21 | 0 5600 | 0 08225 | 0 14675 | 0 17211 | 24.263 |
| 22 | 0 5900 | 0 08312 | 0 23909 | -0.21229 | 22.764 |
| 23 | 0 6200 | 0 08347 | 0 33143 | -0.24961 | 21.222 |
| 24 | 0 6500 | 0 08311 | 0 42377 | -0 28396 | 19.570 |
| 25 | 0 6800 | 0 08185 | 0 51611 | -0 31521 | 17.789 |
| 26 | 0 7100 | 0 07958 | 0 60845 | -0 34313 | 15.832 |
| 27 | 0 7400 | 0 07630 | 0 70080 | -0 36750 | 13.704 |
| 28 | 0 7700 | 0 07195 | 0 79314 | -0 38811 | 11.431 |
| 29 | 0 8000 | 0 06650 | 0 88548 | -0 40478 | 8.989 |
| 30 | 0 8300 | 0 05995 | 0 97782 | -0 41720 | 6.288 |
| 31 | 0 8600 | 0 05234 | 1 07016 | -0 42500 | 3.325 |
| 32 | 0 8900 | 0 04374 | 1 16250 | -0 42780 | 0.103 |
| 33 | 0 9200 | 0 03428 | 1 25484 | 0 42514 | -3.509 |
| 34 | 0 9500 | 0 02441 | 1 34718 | 0 41607 | -7.823 |
| 35 | 0 9750 | 0 01627 | 1 42413 | -0 40261 | -12.197 |
| 36 | 1 0000 | 0 00823 | 1 50109 | -0 38218 | -17.691 |

CHORD 3 4555
STAGGER 27.031
CAMBER 65.199

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | T/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------|---------------|-------------|---------|
| 1 | 0 00563 | -1.57695 | 1.18826 | 1.57695 | 1.18826 |
| 2 | 0 00563 | -1.58034 | 1 18072 | -1.56924 | 1.19099 |
| 3 | 0 00563 | -1.57808 | 1.17405 | -1.56271 | 1.18817 |
| 4 | 0 01049 | -1.51330 | 1.09243 | 1.48670 | 1.11706 |
| 5 | 0 01538 | -1.44246 | 1 00387 | -1 40364 | 1.04017 |
| 6 | 0 02027 | -1 37152 | 0 91613 | -1 32067 | 0 96427 |
| 7 | 0 02512 | -1 30041 | 0 82947 | -1 23789 | 0 88967 |
| 8 | 0 02990 | -1 22^00 | 0 74427 | -1 15540 | 0 81679 |
| 9 | 0 03460 | -1 15720 | 0 66095 | -1 07329 | 0 74610 |
| 10 | 0 03918 | -1 08491 | 0 57994 | -0 99168 | 0 67811 |
| 11 | 0 04362 | -1 01206 | 0 50172 | -0 91063 | 0 61323 |
| 12 | 0 04873 | -0 92385 | 0 41193 | -0 81415 | 0 53968 |
| 13 | 0 05355 | -0 83482 | 0 32692 | -0 71851 | 0 47083 |
| 14 | 0 05805 | -0 74514 | 0 24664 | -0 62350 | 0 40614 |

PHASE III ROTOR

•7PC•

COORD SYSTEM ORIGIN 7 -7.04880 R O. MU O. NB 20 FIA O.

SECTION NO 8 SECTION INI RIM 5.0000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | I/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|--------|---------|-----------------|---------------|-------------|----------|
| 15 | 0 06221 | -0.65486 | 0.17074 | -0.52910 | 0.34507 |
| 16 | 0 06600 | -0.56401 | 0.09892 | -0.43526 | 0.28717 |
| 17 | 0 06943 | -0.47260 | 0.03089 | -0.34200 | 0.23213 |
| 18 | 0 07248 | -0.38052 | -0.03350 | 0.24940 | 0.17987 |
| 19 | 0 07516 | -0.28781 | 0.09429 | -0.15742 | 0.13031 |
| 20 | 0 07746 | -0.19451 | -0.15147 | -0.06604 | 0.08336 |
| 21 | 0 07940 | -0.10066 | -0.20504 | 0.02490 | 0.03895 |
| 22 | 0 08098 | -0.00636 | -0.25507 | 0.11517 | -0.00301 |
| 23 | 0 08225 | 0.08836 | -0.30166 | 0.20514 | -0.04256 |
| 24 | 0 08312 | 0.18352 | -0.34472 | 0.29466 | -0.07987 |
| 25 | 0 08347 | 0.27923 | 0.38404 | 0.38363 | -0.11517 |
| 26 | 0 08311 | 0.37567 | -0.41926 | 0.47187 | -0.14866 |
| 27 | 0 08185 | 0.47291 | -0.44985 | 0.55932 | -0.18056 |
| 28 | 0 07958 | 0.57094 | 0.47542 | 0.64597 | -0.21085 |
| 29 | 0 07630 | 0.66957 | -0.49557 | 0.73202 | -0.23943 |
| 30 | 0 07195 | 0.76850 | -0.50996 | 0.81778 | -0.26625 |
| 31 | 0 06650 | 0.86753 | -0.51826 | 0.90343 | -0.29129 |
| 32 | 0 05995 | 0.96647 | -0.52015 | 0.98916 | -0.31424 |
| 33 | 0 05234 | 1.06492 | -0.51528 | 1.07540 | -0.33472 |
| 34 | 0 04374 | 1.16237 | -0.50338 | 1.16264 | -0.35222 |
| 35 | 0 03428 | 1.25847 | 0.48427 | 1.25122 | -0.36602 |
| 36 | 0 02441 | 1.35292 | -0.45785 | 1.34144 | -0.37428 |
| 37 | 0 01627 | 1.43007 | -0.43008 | 1.41820 | -0.37514 |
| 38 | 0 00823 | 1.49241 | -0.40224 | 1.48302 | -0.37039 |
| 39 | 0 00023 | 1.49941 | -0.39582 | 1.49414 | -0.37299 |
| 40 | 0 00023 | 1.50109 | -0.38218 | 1.50109 | -0.38218 |
| IF RAD | 0 01046 | CENTER AT ALPHA | -1.56988 | UPSILON | 1.18055 |
| TF RAD | 0 01685 | CENTER AT ALPHA | 1.48498 | UPSILON | -0.38712 |

7PC.

PLATE III ROTOR

| | | | | |
|------------------------|----------|--------------------|----------|--------|
| COORD SYSTEM ORIGIN Z | -7.04880 | R O. | MU O | FIA O. |
| STAGE | 3 | ROTOR | NR | 20 |
| SECTION NO | 8 | SECTION H# | RND | 5 0000 |
| CHORD | 3.4555 | STAGGER | CAMBER | |
| | | 27.031 | 65.199 | |
| AREA | 0.678450 | SURFACE ARC LENGTH | 7.27927 | |
| SECTION C.G. | | ALPHA | UPSILON | |
| SURFACE SECTION C.G. | | -0.00510 | -0.00283 | |
| BLADE AXIS | | -0.01169 | -0.03865 | |
| STACKING AXIS (RADIAL) | | -0.01169 | 0.03865 | |
| | | -0.00210 | 0. | |

PHASE III ROTOR

• 790 •

COORD SYSTEM ORIGIN Z -7.04880 R 0. MJ 0. EIA 0.
 STAGE 3. ROTOR NB 20
 SECTION NO 9 SECTION JJ RIO 4.5000

MEANLINE INPUT DATA

| PT | ALPHA | ZETA* | THICKNESS | UPSILON |
|----|----------|---------|-----------|----------|
| 1 | 1.54614 | 45.513 | 0.02150 | 1.04166 |
| 2 | -1.46696 | 45.250 | 0.03934 | 0.96146 |
| 3 | 1.30880 | 44.474 | 0.07431 | 0.80407 |
| 4 | 1.15098 | 42.932 | 0.10784 | 0.65334 |
| 5 | 0.99380 | 40.525 | 0.13959 | 0.51341 |
| 6 | 0.82178 | 37.430 | 0.17225 | 0.37452 |
| 7 | 0.63500 | 33.979 | 0.20490 | 0.24053 |
| 8 | -0.44941 | 30.491 | 0.23424 | 0.12362 |
| 9 | 0.26514 | 26.940 | 0.25993 | 0.02272 |
| 10 | -0.08216 | 23.398 | 0.28118 | -0.06312 |
| 11 | 0.09902 | 20.053 | 0.30376 | -0.13525 |
| 12 | 0.27828 | 16.779 | 0.30376 | 0.19515 |
| 13 | 0.45512 | 13.141 | 0.29726 | -0.24283 |
| 14 | 0.62877 | 9.249 | 0.27289 | -0.27762 |
| 15 | 0.79835 | 4.959 | 0.23570 | -0.29941 |
| 16 | 0.96269 | -1.869 | 0.19328 | -0.30511 |
| 17 | 1.12018 | -13.461 | 0.14981 | -0.28472 |
| 18 | 1.26985 | -28.736 | 0.10590 | -0.22589 |
| 19 | 1.38806 | -41.867 | 0.07153 | -0.13853 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AI | T/C | ALPHA | UPSILON | ZETA* |
|----|--------|---------|----------|---------|--------|
| 1 | 0 | 0.00680 | -1.54614 | 1.04166 | 45.513 |
| 2 | 0.0250 | 0.01203 | -1.47279 | 0.96733 | 45.244 |
| 3 | 0.0500 | 0.01720 | -1.39943 | 0.89371 | 44.941 |
| 4 | 0.0750 | 0.02231 | -1.32608 | 0.82102 | 44.515 |
| 5 | 0.1000 | 0.02732 | -1.25272 | 0.74958 | 43.940 |
| 6 | 0.1250 | 0.03223 | -1.17937 | 0.67980 | 43.164 |
| 7 | 0.1500 | 0.03703 | -1.10601 | 0.61213 | 42.190 |
| 8 | 0.1750 | 0.04171 | -1.03266 | 0.54690 | 41.074 |
| 9 | 0.2000 | 0.04627 | -0.95930 | 0.48434 | 39.824 |
| 10 | 0.2300 | 0.05157 | -0.87128 | 0.41293 | 38.261 |
| 11 | 0.2600 | 0.05667 | -0.78325 | 0.34547 | 36.653 |
| 12 | 0.2900 | 0.06156 | -0.69522 | 0.28188 | 35.032 |
| 13 | 0.3200 | 0.06624 | -0.60720 | 0.22201 | 33.407 |
| 14 | 0.3500 | 0.07070 | -0.51917 | 0.16573 | 31.767 |
| 15 | 0.3800 | 0.07492 | -0.43115 | 0.11296 | 30.112 |
| 16 | 0.4100 | 0.07890 | -0.34312 | 0.06361 | 28.427 |
| 17 | 0.4400 | 0.08259 | -0.25509 | 0.01765 | 26.707 |

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O EIA O
SECTION NO 9 SECTION JJ RHO 4.5000

MEAN LINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | PCI AI | T/C | ALPHA | UPSILON | 7F1A |
|----|--------|---------|----------|----------|---------|
| 18 | 0.4700 | 0.08598 | 0.16707 | 0.02500 | 24.992 |
| 19 | 0.5000 | 0.08901 | -0.07904 | -0.06447 | 23.313 |
| 20 | 0.5300 | 0.09162 | 0.00898 | -0.10092 | 21.682 |
| 21 | 0.5600 | 0.09375 | 0.09701 | 0.13452 | 20.109 |
| 22 | 0.5900 | 0.09529 | 0.18504 | -0.16540 | 18.544 |
| 23 | 0.6200 | 0.09603 | 0.27306 | -0.19357 | 16.931 |
| 24 | 0.6500 | 0.09575 | 0.36109 | -0.21896 | 15.227 |
| 25 | 0.6800 | 0.09415 | 0.44912 | -0.24142 | 13.376 |
| 26 | 0.7100 | 0.09103 | 0.53714 | -0.26079 | 11.430 |
| 27 | 0.7400 | 0.08650 | 0.62517 | -0.27702 | 9.463 |
| 28 | 0.7700 | 0.08082 | 0.71319 | -0.29008 | 7.369 |
| 29 | 0.8000 | 0.07430 | 0.80122 | -0.29967 | 5.020 |
| 30 | 0.8300 | 0.06725 | 0.88925 | -0.30510 | 1.805 |
| 31 | 0.8600 | 0.05987 | 0.97727 | -0.30451 | -2.812 |
| 32 | 0.8900 | 0.05227 | 1.06530 | 0.29562 | -8.972 |
| 33 | 0.9200 | 0.04434 | 1.15333 | 0.27580 | 16.660 |
| 34 | 0.9500 | 0.03614 | 1.24135 | -0.24118 | -26.472 |
| 35 | 0.9700 | 0.02934 | 1.31471 | -0.19722 | -35.053 |
| 36 | 1.0000 | 0.02262 | 1.38806 | -0.13853 | -41.867 |

STAGGER 21.911 CAMBER 87.380

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | T/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------|---------------|-------------|---------|
| 1 | 0.00680 | -1.54614 | 1.04166 | -1.54614 | 1.04166 |
| 2 | 0.00680 | -1.54962 | 1.03318 | -1.53771 | 1.04490 |
| 3 | 0.00680 | -1.54690 | 1.02588 | -1.53037 | 1.04215 |
| 4 | 0.01203 | -1.48629 | 0.95394 | -1.45929 | 0.98072 |
| 5 | 0.01720 | -1.41865 | 0.87446 | -1.38022 | 0.91297 |
| 6 | 0.02231 | -1.35081 | 0.79587 | -1.30135 | 0.84618 |
| 7 | 0.02732 | -1.28270 | 0.71847 | -1.22275 | 0.78069 |
| 8 | 0.03223 | -1.21473 | 0.64263 | -1.14450 | 0.71697 |
| 9 | 0.03703 | -1.14534 | 0.56875 | -1.06669 | 0.65551 |
| 10 | 0.04171 | -1.07599 | 0.49718 | -0.98932 | 0.59662 |
| 11 | 0.04627 | -1.00616 | 0.42814 | -0.91245 | 0.54053 |
| 12 | 0.05157 | -0.92177 | 0.34890 | -0.82078 | 0.47696 |
| 13 | 0.05667 | -0.83675 | 0.27358 | -0.72975 | 0.41737 |
| 14 | 0.06156 | -0.75111 | 0.20217 | -0.63934 | 0.36150 |

PHASE III ROTOR

•ZPC•

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O FTA O.
 SECTION NO 9 SECTION JJ RHO 4.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | T/C | UPPER | | LOWER | |
|--------|---------|-----------------|----------|----------|----------|
| | | ALPHA | UPSILON | ALPHA | UPSILON |
| 15 | 0 06624 | -0.66487 | 0.13457 | -0.54953 | 0.30945 |
| 16 | 0 07070 | -0.57803 | 0.07069 | -0.46032 | 0.26078 |
| 17 | 0 07432 | 0.49058 | 0.01047 | -0.37171 | 0.21545 |
| 18 | 0 07890 | -0.40251 | -0.04611 | -0.28373 | 0.17333 |
| 19 | 0 08259 | -0.31379 | 0.09903 | -0.19640 | 0.13432 |
| 20 | 0 08598 | -0.22451 | -0.14823 | -0.10963 | 0.09823 |
| 21 | 0 08901 | -0.13474 | -0.19372 | -0.02334 | 0.06479 |
| 22 | 0 09162 | -0.04455 | 0.23556 | 0.06251 | 0.03372 |
| 23 | 0 09375 | 0.04604 | -0.27374 | 0.14798 | 0.00470 |
| 24 | 0 09529 | 0.13712 | -0.30826 | 0.23296 | -0.02254 |
| 25 | 0 09603 | 0.22884 | -0.33884 | 0.31729 | -0.04829 |
| 26 | 0 09575 | 0.32132 | -0.36505 | 0.40086 | -0.07287 |
| 27 | 0 09415 | 0.41467 | -0.38627 | 0.48356 | -0.09657 |
| 28 | 0 09103 | 0.50862 | -0.40188 | 0.56567 | -0.11970 |
| 29 | 0 08650 | 0.60268 | -0.41194 | 0.64766 | -0.14210 |
| 30 | 0 08082 | 0.69680 | 0.41682 | 0.72959 | 0.16334 |
| 31 | 0 07430 | 0.79094 | -0.41672 | 0.81150 | -0.18262 |
| 32 | 0 06725 | 0.88590 | 0.41140 | 0.89260 | -0.19880 |
| 33 | 0 05987 | 0.98192 | -0.39907 | 0.97263 | -0.20994 |
| 34 | 0 05227 | 1.07819 | 0.37726 | 1.05241 | 0.21397 |
| 35 | 0 04434 | 1.17343 | -0.34296 | 1.13322 | -0.20863 |
| 36 | 0 03614 | 1.26683 | -0.29233 | 1.21588 | -0.19002 |
| 37 | 0 02934 | 1.34135 | -0.23520 | 1.28806 | -0.15924 |
| 38 | 0 02262 | 1.38628 | 0.19254 | 1.33925 | -0.12901 |
| 39 | 0 02262 | 1.35886 | 0.17260 | 1.36597 | -0.12541 |
| 40 | 0 02262 | 1.38806 | -0.13853 | 1.38806 | -0.13853 |
| LF RAD | 0 01163 | CENTER AT ALPHA | -1.53799 | UPSILON | 1.03336 |
| TF RAD | 0 04003 | CENTER AT ALPHA | 1.35765 | UPSILON | -0.16456 |

PHASE III ROTOR

COORD SYSTEM ORIGIN Z -7 04880 R 0 MJ 0. FIA 0

SECTION NO 9 SECTION JJ PINO 4 5000

CHORD STAGER CAMBER
3 1627 21 911 87 380

AREA 0 653040 SURFACE ARC LENGTH 6.86723

| | | |
|------------------------|----------|----------|
| SECTION C.G. | ALPHA | UPSTION |
| SURFACE | -0 00262 | 0.00462 |
| BLADE AXIS | 0.02762 | -0 04430 |
| STACKING AXIS (RADIAL) | 0 02762 | 0 04430 |
| | 0.00210 | 0 |

PHASE III ROTOR

7000

COORD SYSTEM ORIGIN Z -7.04880 R 0. MU 0. ETA 0.
 SECTION NO 10 SECTION KK RHO 4.00000

MEANLINE INPUT DATA

| PT | ALPHA | ZETA | THICKNESS | UPSILON |
|----|----------|---------|-----------|----------|
| 1 | 1.50909 | 43.941 | 0.02406 | 0.90496 |
| 2 | -1.43057 | 43.561 | 0.04193 | 0.83029 |
| 3 | -1.27469 | 42.412 | 0.07788 | 0.68549 |
| 4 | 1.12025 | 40.431 | 0.11430 | 0.54916 |
| 5 | 0.96721 | 37.671 | 0.15107 | 0.42467 |
| 6 | 0.80066 | 34.266 | 0.19097 | 0.30325 |
| 7 | 0.62075 | 30.512 | 0.23193 | 0.18860 |
| 8 | 0.44277 | 26.847 | 0.26772 | 0.09087 |
| 9 | 0.26670 | 23.311 | 0.29578 | 0.00820 |
| 10 | 0.09278 | 19.951 | 0.31389 | -0.06091 |
| 11 | 0.07877 | 16.862 | 0.32114 | -0.11793 |
| 12 | 0.24739 | 13.859 | 0.31758 | -0.16414 |
| 13 | 0.41247 | 10.450 | 0.30532 | -0.19969 |
| 14 | 0.57286 | 5.935 | 0.28880 | -0.22310 |
| 15 | 0.72762 | -1.538 | 0.26919 | -0.22984 |
| 16 | 0.87574 | -14.246 | 0.24258 | -0.20952 |
| 17 | 1.01635 | -30.971 | 0.20365 | -0.14875 |
| 18 | 1.14898 | -47.068 | 0.15642 | -0.03466 |
| 19 | 1.25280 | -57.710 | 0.11964 | 0.11070 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PC | AI | T/C | ALPHA | UPSILON | ZETA |
|----|----|---------|----------|----------|---------|------|
| 1 | 0 | 0.00837 | -1.50909 | 0.90496 | 43.941 | |
| 2 | 0 | 0.01384 | 1.44004 | 0.83922 | 43.338 | |
| 3 | 0 | 0.05000 | 0.1934 | -1.37099 | 43.038 | |
| 4 | 0 | 0.07500 | 0.02489 | -1.30195 | 42.558 | |
| 5 | 0 | 0.10000 | 0.03050 | -1.23290 | 41.886 | |
| 6 | 0 | 0.12500 | 0.03616 | -1.16385 | 41.033 | |
| 7 | 0 | 0.15000 | 0.04189 | 1.09480 | 39.994 | |
| 8 | 0 | 0.17500 | 0.04766 | -1.02576 | 38.825 | |
| 9 | 0 | 0.20000 | 0.05345 | -0.95671 | 37.534 | |
| 10 | 0 | 0.23000 | 0.06039 | -0.87385 | 35.890 | |
| 11 | 0 | 0.26000 | 0.06724 | -0.79100 | 34.179 | |
| 12 | 0 | 0.29000 | 0.07393 | -0.70814 | 32.440 | |
| 13 | 0 | 0.32000 | 0.08036 | 0.62528 | 30.705 | |
| 14 | 0 | 0.35000 | 0.08644 | 0.54243 | 28.980 | |
| 15 | 0 | 0.38000 | 0.09208 | 0.45957 | 27.270 | |
| 16 | 0 | 0.41000 | 0.09717 | 0.37671 | 25.580 | |
| 17 | 0 | 0.44000 | 0.10162 | 0.29386 | 23.914 | |

PHASE 111 ROTOR

COORD SYSTEM ORIGIN Z -7.04880 R 0 MU 0 EIA 0.

SECTION NO 10 SECTION KK RIM 4 (XXX)

MEAN LINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AL | T/C | ALPHA | UPSILON | ZETA |
|----|--------|---------|----------|----------|---------|
| 18 | 0.4700 | 0.10533 | -0.21100 | -0.01524 | 22.273 |
| 19 | 0.5100 | 0.10824 | -0.12814 | 0.04782 | 20.660 |
| 20 | 0.5300 | 0.11030 | -0.04528 | -0.07776 | 19.081 |
| 21 | 0.5600 | 0.11149 | 0.03757 | -0.10519 | 17.559 |
| 22 | 0.5900 | 0.11178 | 0.12043 | -0.13024 | 16.090 |
| 23 | 0.6200 | 0.11118 | 0.20329 | -0.15298 | 14.596 |
| 24 | 0.6500 | 0.10973 | 0.28614 | 0.17338 | 13.051 |
| 25 | 0.6800 | 0.10758 | 0.36900 | -0.19133 | 11.760 |
| 26 | 0.7100 | 0.10494 | 0.45186 | -0.20660 | 9.467 |
| 27 | 0.7400 | 0.10196 | 0.53471 | 0.21875 | 7.131 |
| 28 | 0.7700 | 0.09869 | 0.61757 | -0.22707 | 4.179 |
| 29 | 0.8000 | 0.09501 | 0.70043 | -0.23024 | -0.021 |
| 30 | 0.8300 | 0.09065 | 0.78328 | -0.22627 | -5.836 |
| 31 | 0.8600 | 0.08515 | 0.86614 | -0.21202 | -14.022 |
| 32 | 0.8900 | 0.07799 | 0.94900 | -0.18379 | -23.566 |
| 33 | 0.9200 | 0.06906 | 1.03185 | -0.13899 | -33.094 |
| 34 | 0.9500 | 0.05878 | 1.11471 | -0.07200 | -44.856 |
| 35 | 0.9700 | 0.05009 | 1.18376 | 0.00996 | -53.785 |
| 36 | 1.0000 | 0.04163 | 1.25280 | 0.11070 | -56.409 |

STAGGER 16.044 CAMBER 100.350

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | T/C | ALPHA | UPSILON | UPPER ALPHA | LOWER ALPHA | UPSILON |
|----|---------|----------|---------|-------------|-------------|---------|
| 1 | 0.00837 | -1.50909 | 0.90496 | -1.50909 | 0.90496 | 0.90496 |
| 2 | 0.00837 | -1.51270 | 0.89533 | 0.89533 | 1.49978 | 0.90898 |
| 3 | 0.00837 | 1.50943 | 0.88726 | 1.50943 | -1.49145 | 0.90607 |
| 4 | 0.01384 | -1.45369 | 0.82476 | 0.82476 | 1.42639 | 0.85369 |
| 5 | 0.01934 | -1.38996 | 0.75407 | 0.75407 | -1.35203 | 0.79469 |
| 6 | 0.02489 | -1.32614 | 0.68406 | 0.68406 | 1.27776 | 0.73676 |
| 7 | 0.03050 | -1.26216 | 0.61509 | 0.61509 | -1.20364 | 0.68035 |
| 8 | 0.03616 | 1.19797 | 0.54749 | 0.54749 | 1.12974 | 0.62589 |
| 9 | 0.04189 | -1.13349 | 0.48154 | 0.48154 | -1.05612 | 0.57376 |
| 10 | 0.04766 | -1.06869 | 0.41755 | 0.41755 | -0.98283 | 0.52424 |
| 11 | 0.05345 | -1.00350 | 0.35567 | 0.35567 | -0.90992 | 0.47748 |
| 12 | 0.06039 | -0.92472 | 0.28447 | 0.28447 | -0.82298 | 0.42507 |
| 13 | 0.06724 | -0.84528 | 0.21572 | 0.21572 | -0.73671 | 0.37660 |
| 14 | 0.07393 | -0.76512 | 0.15255 | 0.15255 | -0.65115 | 0.33186 |

PHASE III ROTOR

7PC

COORD SYSTEM ORIGIN Z -7.04880 R 0. MU 0. EIA 0.

SECTION NO 10 SECTION KK RHO 4.0000

STAGE 3 ROTOR NK 20

| SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS | | | | | | | | | |
|---|---------|----------|---------------|-------------|----------|----------|----------|----------|----------|
| PT | I/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON | ALPHA | UPSILON | ALPHA | UPSILON |
| 15 | 0 08036 | -0.68424 | 0.09200 | -0.56632 | 0.29057 | -0.56632 | 0.29057 | -0.56632 | 0.29057 |
| 16 | 0 08644 | -0.60261 | 0.03509 | -0.48225 | 0.25241 | -0.48225 | 0.25241 | -0.48225 | 0.25241 |
| 17 | 0 09208 | -0.52019 | 0.01815 | -0.39895 | 0.21707 | -0.39895 | 0.21707 | -0.39895 | 0.21707 |
| 18 | 0 09717 | -0.43700 | 0.06766 | -0.31642 | 0.18422 | -0.31642 | 0.18422 | -0.31642 | 0.18422 |
| 19 | 0 10162 | -0.35305 | -0.11339 | -0.23467 | 0.15358 | -0.23467 | 0.15358 | -0.23467 | 0.15358 |
| 20 | 0 10533 | -0.26836 | -0.15530 | -0.15363 | 0.12482 | -0.15363 | 0.12482 | -0.15363 | 0.12482 |
| 21 | 0 10824 | -0.18301 | 0.19335 | -0.07327 | 0.09771 | -0.07327 | 0.09771 | -0.07327 | 0.09771 |
| 22 | 0 11030 | 0.09710 | 0.22755 | 0.08653 | 0.07203 | 0.08653 | 0.07203 | 0.08653 | 0.07203 |
| 23 | 0 11149 | 0.01076 | 0.25792 | 0.08590 | 0.04755 | 0.08590 | 0.04755 | 0.08590 | 0.04755 |
| 24 | 0 11178 | 0.07591 | -0.28456 | 0.16494 | 0.02408 | 0.16494 | 0.02408 | 0.16494 | 0.02408 |
| 25 | 0 11118 | 0.16303 | 0.30758 | 0.24354 | 0.00161 | 0.24354 | 0.00161 | 0.24354 | 0.00161 |
| 26 | 0 10973 | 0.25054 | -0.32699 | 0.32175 | -0.01978 | 0.32175 | -0.01978 | 0.32175 | -0.01978 |
| 27 | 0 10758 | 0.33855 | -0.34288 | 0.39945 | -0.03978 | 0.39945 | -0.03978 | 0.39945 | -0.03978 |
| 28 | 0 10494 | 0.42705 | -0.35533 | 0.47666 | -0.05786 | 0.47666 | -0.05786 | 0.47666 | -0.05786 |
| 29 | 0 10196 | 0.51652 | -0.36413 | 0.55290 | -0.07337 | 0.55290 | -0.07337 | 0.55290 | -0.07337 |
| 30 | 0 09869 | 0.60723 | -0.36850 | 0.62790 | -0.08564 | 0.62790 | -0.08564 | 0.62790 | -0.08564 |
| 31 | 0 09501 | 0.70048 | -0.36676 | 0.70038 | -0.09372 | 0.70038 | -0.09372 | 0.70038 | -0.09372 |
| 32 | 0 09065 | 0.79653 | -0.35585 | 0.77004 | -0.09669 | 0.77004 | -0.09669 | 0.77004 | -0.09669 |
| 33 | 0 08515 | 0.89579 | -0.33072 | 0.83649 | -0.09331 | 0.83649 | -0.09331 | 0.83649 | -0.09331 |
| 34 | 0 07799 | 0.99380 | -0.28650 | 0.90419 | -0.08107 | 0.90419 | -0.08107 | 0.90419 | -0.08107 |
| 35 | 0 06906 | 1.08604 | -0.22713 | 0.97767 | -0.05586 | 0.97767 | -0.05586 | 0.97767 | -0.05586 |
| 36 | 0 05878 | 1.17428 | -0.13187 | 1.05514 | -0.01213 | 1.05514 | -0.01213 | 1.05514 | -0.01213 |
| 37 | 0 05009 | 1.24183 | -0.03257 | 1.12569 | 0.05248 | 1.12569 | 0.05248 | 1.12569 | 0.05248 |
| 38 | 0 04163 | 1.27402 | 0.02398 | 1.16781 | 0.10118 | 1.16781 | 0.10118 | 1.16781 | 0.10118 |
| 39 | 0 04163 | 1.28179 | 0.06240 | 1.20866 | 0.12152 | 1.20866 | 0.12152 | 1.20866 | 0.12152 |
| 40 | 0 04163 | 1.25280 | 0.11070 | 1.25280 | 0.11070 | 1.25280 | 0.11070 | 1.25280 | 0.11070 |
| CENTER AT ALPHA -1.49967 UPSILON 0.89593 | | | | | | | | | |
| CENTER AT ALPHA 1.21593 UPSILON 0.05572 | | | | | | | | | |

7000

PLATE III ROTOR

| | | | | | | | | | | | |
|-----------------------|----------|------------|--------------------|---------|---------|----|----|----|-------|-----|---|
| COMPD SYSTEM ORIGIN | Z | -7 | 04880 | P | Q | MU | Q. | NR | 20 | ETA | 0 |
| SECTION NO | 10 | SECTION KK | | | PIN | | | 4 | XXXX | | |
| GROUP | 2 | STAGGER | | | CAMTER | | | | | | |
| | B/3R | 16.044 | | | 100.150 | | | | | | |
| AREA | 0 | 690003 | SURFACE ARC LENGTH | | | 6 | | | 56279 | | |
| SECTION C.G. | ALPHA | | | UPSTION | | | | | | | |
| SURFACE | 0.01407 | | | 0.01066 | | | | | | | |
| SECTION C.G. | 0 | | | 0.02644 | | | | | | | |
| PLATE AXIS | -0.02644 | | | 0.01869 | | | | | | | |
| PLACING AXIS (RADIAL) | -0.00210 | | | 0. | | | | | | | |

PHASE III ROTOR

COORD SYSTEM ORIGIN Z -7.0480 R 0 MJ 0 FTA 0
 STAGE 3 ROTOR NR 20
 SECTION NO 11 SECTION LI RND 3.5000

MEANLINE INPUT DATA

| Pt | ALPHA | ZETA* | THICKNESS | UPSILON |
|----|----------|---------|-----------|----------|
| 1 | -1.48469 | 41.825 | 0.02987 | 0.78336 |
| 2 | 1.40871 | 41.056 | 0.05116 | 0.71579 |
| 3 | 1.25816 | 39.143 | 0.09492 | 0.58764 |
| 4 | 1.10917 | 36.700 | 0.13849 | 0.47057 |
| 5 | 0.96156 | 33.924 | 0.17967 | 0.36579 |
| 6 | 0.80088 | 30.818 | 0.22031 | 0.26422 |
| 7 | 0.62764 | 27.458 | 0.25759 | 0.16807 |
| 8 | 0.45653 | 24.094 | 0.28678 | 0.08592 |
| 9 | 0.28763 | 20.826 | 0.30795 | 0.01670 |
| 10 | 0.12146 | 17.909 | 0.32197 | -0.04108 |
| 11 | 0.04162 | 15.329 | 0.33055 | -0.08922 |
| 12 | 0.20104 | 12.617 | 0.33634 | -0.12866 |
| 13 | 0.35597 | 8.898 | 0.33914 | -0.15804 |
| 14 | 0.50556 | 2.492 | 0.33719 | -0.17276 |
| 15 | 0.64884 | -9.251 | 0.32794 | -0.16303 |
| 16 | 0.73400 | -26.414 | 0.30457 | -0.11434 |
| 17 | 0.91046 | -44.165 | 0.26127 | -0.01241 |
| 18 | 1.02766 | -58.058 | 0.20737 | 0.15672 |
| 19 | 1.11752 | -66.214 | 0.16776 | 0.35993 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| Pt | PCT AL | T/C | ALPHA | UPSILON | ZETA* |
|----|--------|---------|----------|---------|--------|
| 1 | 0 | 0.01133 | 1.48469 | 0.78336 | 41.825 |
| 2 | 0.0250 | 0.01823 | -1.41964 | 0.72542 | 41.459 |
| 3 | 0.0500 | 0.02530 | -1.35458 | 0.66870 | 40.693 |
| 4 | 0.0750 | 0.03250 | -1.28953 | 0.61359 | 39.825 |
| 5 | 0.1000 | 0.03977 | -1.22447 | 0.56025 | 38.852 |
| 6 | 0.1250 | 0.04700 | -1.15941 | 0.50884 | 37.755 |
| 7 | 0.1500 | 0.05414 | -1.09436 | 0.45955 | 36.527 |
| 8 | 0.1750 | 0.06112 | -1.02930 | 0.41247 | 35.244 |
| 9 | 0.2000 | 0.06788 | -0.96425 | 0.36760 | 33.943 |
| 10 | 0.2300 | 0.07562 | -0.88618 | 0.31659 | 32.382 |
| 11 | 0.2600 | 0.08291 | -0.80812 | 0.26853 | 30.850 |
| 12 | 0.2900 | 0.08968 | -0.73005 | 0.22329 | 29.333 |
| 13 | 0.3200 | 0.09589 | 0.65198 | 0.18077 | 27.806 |
| 14 | 0.3500 | 0.10150 | -0.57392 | 0.14093 | 26.269 |
| 15 | 0.3800 | 0.10650 | 0.49585 | 0.10370 | 24.719 |
| 16 | 0.4100 | 0.11087 | 0.41778 | 0.06903 | 23.166 |
| 17 | 0.4400 | 0.11463 | 0.33972 | 0.03685 | 21.647 |

PHASE III ROTOR

COORD SYSTEM ORIGIN 7 -7 04880 R O. MU O FIA O

SECTION NO 11 SECTION 11 RMO 3 5000

MEAN INF COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AT | I/C | ALPHA | UPSILON | ZETA |
|----|--------|---------|----------|----------|---------|
| 18 | 0 4700 | 0 11780 | 0 26165 | 0 00703 | 20 177 |
| 19 | 0 5000 | 0 12041 | 0 18358 | -0 02058 | 18 785 |
| 20 | 0 5300 | 0 12251 | -0 10552 | 0 04614 | 17 482 |
| 21 | 0 5600 | 0 12417 | 0 02745 | -0 06979 | 16 242 |
| 22 | 0 5900 | 0 12552 | 0 05061 | -0 09165 | 15 051 |
| 23 | 0 6200 | 0 12669 | 0 12868 | 0 11175 | 13 792 |
| 24 | 0 6500 | 0 12764 | 0 20675 | 0 12992 | 12 386 |
| 25 | 0 6800 | 0 12833 | 0 28481 | -0 14588 | 10 654 |
| 26 | 0 7100 | 0 12865 | 0 36288 | -0 15908 | 8 449 |
| 27 | 0 7400 | 0 12848 | 0 44095 | -0 16865 | 5 325 |
| 28 | 0 7700 | 0 12772 | 0 51901 | -0 17308 | 0 938 |
| 29 | 0 8000 | 0 12614 | 0 59708 | -0 17030 | -5 382 |
| 30 | 0 8300 | 0 12322 | 0 67515 | -0 15731 | -13 856 |
| 31 | 0 8600 | 0 11825 | 0 75321 | -0 13011 | -24 767 |
| 32 | 0 8900 | 0 11034 | 0 83128 | -0 08357 | -36 479 |
| 33 | 0 9200 | 0 09928 | 0 90934 | -0 01360 | -46 668 |
| 34 | 0 9500 | 0 08580 | 0 98741 | 0 08652 | -57 325 |
| 35 | 0 9750 | 0 07440 | 1 05247 | 0 20789 | -65 262 |
| 36 | 1 0000 | 0 06363 | 1 11752 | 0 35993 | -67 552 |

CHORD 2 6364 STAGGER 9 242 CAMBER 109 377

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | I/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------|---------------|-------------|---------|
| 1 | 0 01133 | -1 48469 | 0 78336 | -1 48469 | 0 78336 |
| 2 | 0 01133 | -1 48986 | 0 77113 | -1 47326 | 0 78884 |
| 3 | 0 01133 | -1 48462 | 0 76118 | -1 46265 | 0 78571 |
| 4 | 0 01823 | 1 43555 | 0 70741 | -1 40372 | 0 74344 |
| 5 | 0 02530 | 1 37632 | 0 64341 | -1 33284 | 0 69398 |
| 6 | 0 03250 | -1 31697 | 0 58068 | -1 26208 | 0 64649 |
| 7 | 0 03977 | -1 25735 | 0 51942 | -1 19159 | 0 60107 |
| 8 | 0 04700 | -1 19735 | 0 45985 | -1 12148 | 0 55783 |
| 9 | 0 05414 | -1 13684 | 0 40219 | -1 05188 | 0 51690 |
| 10 | 0 06112 | -1 07580 | 0 34657 | -0 98281 | 0 47827 |
| 11 | 0 06788 | -0 01421 | 0 29337 | -0 91429 | 0 44183 |
| 12 | 0 07462 | -0 93957 | 0 23240 | -0 84279 | 0 40077 |
| 13 | 0 08291 | -0 86416 | 0 17470 | -0 75207 | 0 36237 |
| 14 | 0 08968 | 0 78796 | 0 12023 | 0 67213 | 0 32635 |

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| SECTION NO | SECTION | ILL | RHD | 3.5000 |
|------------|---------|-----|-----|--------|
| 11 | | | | |

| REF | I/C | ALPHA | UPSILON | ALPHA | UPSILON |
|-----|-----|-------|---------|-------|---------|
| 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 | 9 | 9 |
| 10 | 10 | 10 | 10 | 10 | 10 |
| 11 | 11 | 11 | 11 | 11 | 11 |
| 12 | 12 | 12 | 12 | 12 | 12 |
| 13 | 13 | 13 | 13 | 13 | 13 |
| 14 | 14 | 14 | 14 | 14 | 14 |
| 15 | 15 | 15 | 15 | 15 | 15 |
| 16 | 16 | 16 | 16 | 16 | 16 |
| 17 | 17 | 17 | 17 | 17 | 17 |
| 18 | 18 | 18 | 18 | 18 | 18 |
| 19 | 19 | 19 | 19 | 19 | 19 |
| 20 | 20 | 20 | 20 | 20 | 20 |
| 21 | 21 | 21 | 21 | 21 | 21 |
| 22 | 22 | 22 | 22 | 22 | 22 |
| 23 | 23 | 23 | 23 | 23 | 23 |
| 24 | 24 | 24 | 24 | 24 | 24 |
| 25 | 25 | 25 | 25 | 25 | 25 |
| 26 | 26 | 26 | 26 | 26 | 26 |
| 27 | 27 | 27 | 27 | 27 | 27 |
| 28 | 28 | 28 | 28 | 28 | 28 |
| 29 | 29 | 29 | 29 | 29 | 29 |
| 30 | 30 | 30 | 30 | 30 | 30 |
| 31 | 31 | 31 | 31 | 31 | 31 |
| 32 | 32 | 32 | 32 | 32 | 32 |
| 33 | 33 | 33 | 33 | 33 | 33 |
| 34 | 34 | 34 | 34 | 34 | 34 |
| 35 | 35 | 35 | 35 | 35 | 35 |
| 36 | 36 | 36 | 36 | 36 | 36 |
| 37 | 37 | 37 | 37 | 37 | 37 |
| 38 | 38 | 38 | 38 | 38 | 38 |
| 39 | 39 | 39 | 39 | 39 | 39 |
| 40 | 40 | 40 | 40 | 40 | 40 |
| 41 | 41 | 41 | 41 | 41 | 41 |
| 42 | 42 | 42 | 42 | 42 | 42 |
| 43 | 43 | 43 | 43 | 43 | 43 |
| 44 | 44 | 44 | 44 | 44 | 44 |
| 45 | 45 | 45 | 45 | 45 | 45 |
| 46 | 46 | 46 | 46 | 46 | 46 |
| 47 | 47 | 47 | 47 | 47 | 47 |
| 48 | 48 | 48 | 48 | 48 | 48 |
| 49 | 49 | 49 | 49 | 49 | 49 |
| 50 | 50 | 50 | 50 | 50 | 50 |
| 51 | 51 | 51 | 51 | 51 | 51 |
| 52 | 52 | 52 | 52 | 52 | 52 |
| 53 | 53 | 53 | 53 | 53 | 53 |
| 54 | 54 | 54 | 54 | 54 | 54 |
| 55 | 55 | 55 | 55 | 55 | 55 |
| 56 | 56 | 56 | 56 | 56 | 56 |
| 57 | 57 | 57 | 57 | 57 | 57 |
| 58 | 58 | 58 | 58 | 58 | 58 |
| 59 | 59 | 59 | 59 | 59 | 59 |
| 60 | 60 | 60 | 60 | 60 | 60 |
| 61 | 61 | 61 | 61 | 61 | 61 |
| 62 | 62 | 62 | 62 | 62 | 62 |
| 63 | 63 | 63 | 63 | 63 | 63 |
| 64 | 64 | 64 | 64 | 64 | 64 |
| 65 | 65 | 65 | 65 | 65 | 65 |
| 66 | 66 | 66 | 66 | 66 | 66 |
| 67 | 67 | 67 | 67 | 67 | 67 |
| 68 | 68 | 68 | 68 | 68 | 68 |
| 69 | 69 | 69 | 69 | 69 | 69 |
| 70 | 70 | 70 | 70 | 70 | 70 |
| 71 | 71 | 71 | 71 | 71 | 71 |
| 72 | 72 | 72 | 72 | 72 | 72 |
| 73 | 73 | 73 | 73 | 73 | 73 |
| 74 | 74 | 74 | 74 | 74 | 74 |
| 75 | | | | | |

| LF | PAD | 0 | 01655 | CENTER AT ALPHA | -1.47236 | UPSI10N |
|----|-----|--------|----------|-----------------|----------|----------|
| 15 | 0 | 01658 | -0.71095 | 0.06897 | -0.59302 | 0.29258 |
| 16 | 0 | 01050 | -0.63313 | 0.02095 | -0.51470 | 0.26091 |
| 17 | 0 | 01050 | -0.55456 | 0.02382 | -0.43714 | 0.23122 |
| 18 | 0 | 01087 | -0.47528 | -0.06533 | -0.36029 | 0.20340 |
| 19 | 0 | 01463 | -0.39546 | -0.10359 | -0.28398 | 0.17730 |
| 20 | 0 | 01180 | -0.31521 | -0.13872 | -0.20809 | 0.15278 |
| 21 | 0 | 01204 | -0.23470 | 0.17085 | -0.13247 | 0.12969 |
| 22 | 0 | 01251 | -0.15403 | -0.20017 | -0.05700 | 0.10790 |
| 23 | 0 | 01217 | -0.07323 | 0.22694 | 0.01833 | 0.08736 |
| 24 | 0 | 01252 | 0.00765 | -0.25144 | 0.09358 | 0.05814 |
| 25 | 0 | 01669 | 0.08887 | -0.27393 | 0.16849 | 0.05044 |
| 26 | 0 | 01264 | 0.17066 | -0.29425 | 0.24284 | 0.03442 |
| 27 | 0 | 01283 | 0.25354 | -0.31213 | 0.31609 | 0.02036 |
| 28 | 0 | 01285 | 0.33796 | -0.32682 | 0.38780 | 0.00867 |
| 29 | 0 | 01288 | 0.42523 | -0.33728 | 0.45666 | -0.00002 |
| 30 | 0 | 01212 | 0.51626 | -0.34141 | 0.52177 | -0.00474 |
| 31 | 0 | 01214 | 0.61268 | -0.33584 | 0.58148 | -0.00476 |
| 32 | 0 | 01222 | 0.71404 | -0.31501 | 0.63625 | -0.00040 |
| 33 | 0 | 011825 | 0.81852 | -0.27166 | 0.68791 | 0.01143 |
| 34 | 0 | 01034 | 0.91775 | 0.20053 | 0.74480 | 0.03338 |
| 35 | 0 | 00928 | 1.00454 | -0.10340 | 0.81415 | 0.07621 |
| 36 | 0 | 00850 | 1.08261 | 0.02546 | 0.89221 | 0.14758 |
| 37 | 0 | 07440 | 1.14154 | 0.16685 | 0.96339 | 0.24893 |
| 38 | 0 | 06363 | 1.16898 | 0.27111 | 1.00345 | 0.32232 |
| 39 | 0 | 06363 | 1.16935 | 0.30300 | 1.05281 | 0.36227 |
| 40 | 0 | 06363 | 1.11752 | 0.35993 | 1.11752 | 0.35993 |
| LF | PAD | 0 | 01655 | CENTER AT ALPHA | -1.47236 | UPSI10N |
| 15 | 0 | 01658 | -0.71095 | 0.06897 | -0.59302 | 0.29258 |
| 16 | 0 | 01050 | -0.63313 | 0.02095 | -0.51470 | 0.26091 |
| 17 | 0 | 01050 | -0.55456 | 0.02382 | -0.43714 | 0.23122 |
| 18 | 0 | 01087 | -0.47528 | -0.06533 | -0.36029 | 0.20340 |
| 19 | 0 | 01463 | -0.39546 | -0.10359 | -0.28398 | 0.17730 |
| 20 | 0 | 01180 | -0.31521 | -0.13872 | -0.20809 | 0.15278 |
| 21 | 0 | 01204 | -0.23470 | 0.17085 | -0.13247 | 0.12969 |
| 22 | 0 | 01251 | -0.15403 | -0.20017 | -0.05700 | 0.10790 |
| 23 | 0 | 01217 | -0.07323 | 0.22694 | 0.01833 | 0.08736 |
| 24 | 0 | 01252 | 0.00765 | -0.25144 | 0.09358 | 0.05814 |
| 25 | 0 | 01669 | 0.08887 | -0.27393 | 0.16849 | 0.05044 |
| 26 | 0 | 01264 | 0.17066 | -0.29425 | 0.24284 | 0.03442 |
| 27 | 0 | 01283 | 0.25354 | -0.31213 | 0.31609 | 0.02036 |
| 28 | 0 | 01285 | 0.33796 | -0.32682 | 0.38780 | 0.00867 |
| 29 | 0 | 01288 | 0.42523 | -0.33728 | 0.45666 | -0.00002 |
| 30 | 0 | 01212 | 0.51626 | -0.34141 | 0.52177 | -0.00474 |
| 31 | 0 | 01214 | 0.61268 | -0.33584 | 0.58148 | -0.00476 |
| 32 | 0 | 01222 | 0.71404 | -0.31501 | 0.63625 | -0.00040 |
| 33 | 0 | 011825 | 0.81852 | -0.27166 | 0.68791 | 0.01143 |
| 34 | 0 | 01034 | 0.91775 | 0.20053 | 0.74480 | 0.03338 |
| 35 | 0 | 0092 | | | | |

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PHASE III ROTOR

| | | | | | |
|----------------------------|----------|--------------------|----------|--------|---------|
| COORD SYSTEM ORIGIN | 7 | 7 0480 | R 0 | NR 0 | FTA 0 |
| SECTION NG | 11 | SECTION 11 | | RHD | 3.5000 |
| CHORD | 2 6364 | STAGGER | 9.242 | CAMBER | 109.377 |
| ARFA | 0 756786 | SURFACE ARC LENGTH | 6.39540 | | |
| SECTION C.G. | | ALPHA | UPSILON | | |
| STREAMSURFACE SECTION C.G. | | 0.02810 | 0.04281 | | |
| PIADT AXIS | | -0.00222 | -0.00722 | | |
| STACKING AXIS (RADIAL) | | -0.00222 | 0.00722 | | |
| | | -0.00210 | 0. | | |

PHASE III ROTOR

COORD SYSTEM ORIGIN Z -7.04880 R 0. MU 0 FIA 0
 SECTION NO 12 SECTION MM RIM 3 0000

MEANLINE INPUT DATA

| PT | ALPHA | ZETA | THICKNESS | UPSILON |
|----|----------|---------|-----------|----------|
| 1 | 1.46988 | 38.315 | 0.04052 | 0.68852 |
| 2 | 1.39601 | 37.331 | 0.06329 | 0.63176 |
| 3 | 1.24977 | 35.338 | 0.10706 | 0.52561 |
| 4 | -1.10532 | 33.313 | 0.14741 | 0.42853 |
| 5 | -0.96254 | 31.238 | 0.18362 | 0.33970 |
| 6 | 0.80728 | 28.752 | 0.21844 | 0.25107 |
| 7 | 0.64008 | 25.568 | 0.25072 | 0.16584 |
| 8 | -0.47513 | 22.079 | 0.27763 | 0.09339 |
| 9 | 0.31283 | 18.779 | 0.30004 | 0.03336 |
| 10 | -0.15351 | 16.208 | 0.31908 | -0.01642 |
| 11 | 0.00208 | 14.074 | 0.33633 | -0.05836 |
| 12 | 0.15324 | 11.543 | 0.35572 | 0.09265 |
| 13 | 0.29881 | 7.390 | 0.37441 | 0.11645 |
| 14 | 0.43810 | -0.971 | 0.38608 | -0.12247 |
| 15 | 0.57006 | -16.643 | 0.38670 | 0.09622 |
| 16 | 0.69226 | -36.484 | 0.36656 | -0.01917 |
| 17 | 0.80458 | -53.316 | 0.31889 | 0.12393 |
| 18 | 0.90634 | -64.882 | 0.25833 | 0.34811 |
| 19 | 0.98224 | -71.305 | 0.21587 | 0.60917 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AI | T/C | ALPHA | UPSILON | ZETA |
|----|--------|---------|----------|---------|--------|
| 1 | 0 | 0.01651 | -1.46988 | 0.68852 | 38.315 |
| 2 | 0.0250 | 0.02422 | -1.40858 | 0.64123 | 37.089 |
| 3 | 0.0500 | 0.03184 | 1.34727 | 0.59554 | 36.309 |
| 4 | 0.0750 | 0.03931 | -1.28597 | 0.55116 | 35.475 |
| 5 | 0.1000 | 0.04659 | -1.22467 | 0.50819 | 34.577 |
| 6 | 0.1250 | 0.05364 | -1.16336 | 0.46664 | 33.689 |
| 7 | 0.1500 | 0.06044 | -1.10206 | 0.42643 | 32.834 |
| 8 | 0.1750 | 0.06695 | -1.04076 | 0.38751 | 31.985 |
| 9 | 0.2000 | 0.07318 | -0.97946 | 0.34986 | 31.122 |
| 10 | 0.2250 | 0.08025 | 0.90589 | 0.30637 | 30.050 |
| 11 | 0.2500 | 0.08688 | 0.83233 | 0.26478 | 28.899 |
| 12 | 0.2750 | 0.09307 | 0.75877 | 0.22519 | 27.659 |
| 13 | 0.3000 | 0.09885 | -0.68520 | 0.18772 | 26.304 |
| 14 | 0.3250 | 0.10422 | -0.61164 | 0.15251 | 24.833 |
| 15 | 0.3500 | 0.10920 | 0.53807 | 0.11964 | 23.305 |
| 16 | 0.4000 | 0.11380 | -0.46451 | 0.08913 | 21.736 |
| 17 | 0.4400 | 0.11808 | 0.39095 | 0.06094 | 20.211 |

PIA'1 111 ROTOR

COORD SYSTEM ORIGIN 7 -7 04880 R O. MU O. EIA O.
 STAGE 3. ROTOR NR 20
 SECTION NO 12 SECTION MM RND 3.0000

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | P1 | AI | I/C | ALPHA | UPSILON | 7FIA* |
|----|----|------|-----|-------|----------|---------|
| 18 | 0 | 4700 | 0 | 12206 | 0.31738 | 18.783 |
| 19 | 0 | 5000 | 0 | 12579 | -0.24382 | 17.488 |
| 20 | 0 | 5300 | 0 | 12929 | -0.17026 | 16.368 |
| 21 | 0 | 5600 | 0 | 13259 | 0.09669 | 15.370 |
| 22 | 0 | 5900 | 0 | 13590 | -0.02313 | 14.363 |
| 23 | 0 | 6200 | 0 | 13949 | 0.05043 | 13.288 |
| 24 | 0 | 6500 | 0 | 14339 | 0.12400 | 11.957 |
| 25 | 0 | 6800 | 0 | 14743 | 0.19756 | 10.261 |
| 26 | 0 | 7100 | 0 | 15129 | 0.27112 | 7.821 |
| 27 | 0 | 7400 | 0 | 15453 | 0.34469 | 4.328 |
| 28 | 0 | 7700 | 0 | 15689 | 0.41825 | -1.169 |
| 29 | 0 | 8000 | 0 | 15819 | 0.49181 | -9.118 |
| 30 | 0 | 8300 | 0 | 15773 | 0.56538 | 20.073 |
| 31 | 0 | 8600 | 0 | 15443 | 0.63894 | -33.179 |
| 32 | 0 | 8900 | 0 | 14679 | 0.71251 | 46.310 |
| 33 | 0 | 9200 | 0 | 13396 | 0.78607 | -56.587 |
| 34 | 0 | 9500 | 0 | 11682 | 0.85963 | -65.634 |
| 35 | 0 | 9700 | 0 | 10184 | 0.92094 | 72.703 |
| 36 | 1 | 0000 | 0 | 08799 | 0.98224 | -74.791 |

CHOPD 2 4534
 STAGGER 1.853
 CAMBER 113.106

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | I/C | ALPHA | UPSILON | UPPER | ALPHA | UPSILON | LOWER | ALPHA | UPSILON |
|----|-----|-------|----------|---------|----------|---------|----------|---------|---------|
| 1 | 0 | 01651 | 1.46988 | 0.68852 | -1.46988 | 0.68852 | -1.46988 | 0.68852 | 0.68852 |
| 2 | 0 | 01651 | 1.47452 | 0.67134 | -1.45493 | 0.69710 | -1.45493 | 0.69710 | 0.69710 |
| 3 | 0 | 01651 | 1.46798 | 0.65820 | -1.44011 | 0.69406 | -1.44011 | 0.69406 | 0.69406 |
| 4 | 0 | 02422 | -1.42650 | 0.61752 | -1.39056 | 0.66493 | -1.39056 | 0.66493 | 0.66493 |
| 5 | 0 | 03184 | -1.37040 | 0.56406 | -1.32414 | 0.62701 | -1.32414 | 0.62701 | 0.62701 |
| 6 | 0 | 03931 | -1.31396 | 0.51189 | -1.25798 | 0.59044 | -1.25798 | 0.59044 | 0.59044 |
| 7 | 0 | 04659 | -1.25710 | 0.46113 | -1.19223 | 0.55525 | -1.19223 | 0.55525 | 0.55525 |
| 8 | 0 | 05364 | 1.19986 | 0.41189 | -1.12687 | 0.52139 | -1.12687 | 0.52139 | 0.52139 |
| 9 | 0 | 06044 | -1.14226 | 0.36414 | -1.06186 | 0.48873 | -1.06186 | 0.48873 | 0.48873 |
| 10 | 0 | 06695 | -1.08426 | 0.31785 | -0.99725 | 0.45717 | -0.99725 | 0.45717 | 0.45717 |
| 11 | 0 | 07318 | -1.02585 | 0.27301 | -0.93306 | 0.42671 | -0.93306 | 0.42671 | 0.42671 |
| 12 | 0 | 08025 | 0.95519 | 0.22116 | -0.85660 | 0.39158 | -0.85660 | 0.39158 | 0.39158 |
| 13 | 0 | 08688 | 0.88383 | 0.17148 | -0.78083 | 0.35808 | -0.78083 | 0.35808 | 0.35808 |
| 14 | 0 | 09307 | 0.81177 | 0.12406 | -0.70577 | 0.32631 | -0.70577 | 0.32631 | 0.32631 |

PHASE III ROTOR

1/PC.

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O. FIA O.

SECTION NO 12 SECTION MM RND 3.0000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | I/C | UPPER | | LOWER | |
|---|---------|----------|----------|----------|---------|
| | | ALPHA | UPSILON | ALPHA | UPSILON |
| 15 | 0 07885 | -0.73894 | 0.07901 | -0.63147 | 0.29642 |
| 16 | 0 10422 | -0.66533 | 0.03648 | -0.55795 | 0.26853 |
| 17 | 0 10920 | -0.59107 | 0.00338 | 0.48508 | 0.24266 |
| 18 | 0 11380 | -0.51621 | -0.04055 | -0.41281 | 0.21881 |
| 19 | 0 11808 | -0.44099 | 0.07438 | -0.34091 | 0.19687 |
| 20 | 0 12206 | -0.36560 | -0.10685 | -0.26917 | 0.17666 |
| 21 | 0 12579 | -0.29019 | -0.13635 | -0.19745 | 0.15801 |
| 22 | 0 12929 | -0.21495 | -0.16371 | -0.12556 | 0.14064 |
| 23 | 0 13259 | -0.13980 | -0.18928 | -0.05358 | 0.12438 |
| 24 | 0 13590 | -0.06448 | -0.21348 | 0.01822 | 0.10952 |
| 25 | 0 13949 | 0.01110 | -0.23664 | 0.08976 | 0.09642 |
| 26 | 0 14339 | 0.08755 | -0.25869 | 0.16044 | 0.08547 |
| 27 | 0 14743 | 0.16534 | -0.27909 | 0.22978 | 0.07684 |
| 28 | 0 15129 | 0.24587 | 0.29679 | 0.29638 | 0.07095 |
| 29 | 0 15453 | 0.33038 | -0.30996 | 0.35899 | 0.06809 |
| 30 | 0 15819 | 0.42218 | -0.31561 | 0.41432 | 0.06924 |
| 31 | 0 15819 | 0.52257 | 0.30851 | 0.46106 | 0.07470 |
| 32 | 0 15773 | 0.63178 | -0.27970 | 0.49897 | 0.08377 |
| 33 | 0 15443 | 0.74261 | -0.21967 | 0.53527 | 0.09743 |
| 34 | 0 14679 | 0.84271 | -0.12355 | 0.58230 | 0.12521 |
| 35 | 0 13396 | 0.92324 | 0.00420 | 0.64890 | 0.18518 |
| 36 | 0 11682 | 0.99017 | 0.16923 | 0.72909 | 0.28747 |
| 37 | 0 10184 | 1.04021 | 0.35608 | 0.80166 | 0.43037 |
| 38 | 0 08799 | 1.06507 | 0.47434 | 0.84351 | 0.54098 |
| 39 | 0 08799 | 1.05637 | 0.54648 | 0.89843 | 0.60076 |
| 40 | 0 08799 | 0.98224 | 0.60917 | 0.98224 | 0.60917 |
| IF RAD 0 02288 CENTER AT ALPHA -1.45186 UPSILON 0.67443 | | | | | |
| TF RAD 0 11619 CENTER AT ALPHA 0.95114 UPSILON 0.49721 | | | | | |

PHASE III ROTOR

| | | | | | | | | |
|------------------------|----------|--------------------|---|----|----|---|----------|--------|
| COORD SYSTEM ORIGIN | 7 | -7.04880 | R | O. | MJ | 0 | ETA | 0 |
| STAGE | 3. | ROTOR | | | | | NB | 20 |
| SECTION NO | 12 | SECTION MM | | | | | RND | 3.0000 |
| GROUP | 2 | STAGGER | | | | | CAMBER | |
| | 4574 | 1 853 | | | | | 113.106 | |
| APIA | 0 811752 | SURFACE ARC LENGTH | | | | | 6.34665 | |
| SECTION C. G. | | ALPHA | | | | | UPSILON | |
| SURFACE SECTION C. G. | | 0.06690 | | | | | 0.09445 | |
| BLADE AXIS | | 0.04555 | | | | | -0.00062 | |
| STACKING AXIS (RADIAL) | | 0.04555 | | | | | -0.00062 | |
| | | -0.00210 | | | | | 0 | |

PHASE III ROTOR

•7PC•

COORD SYSTEM ORIGIN Z -7.04880 R O. MU O FIA O.
 STAGE 3 ROTOR NR 20
 SECTION NO 13 SECTION NW RND 2 5000

MEANLINE INPUT DATA

| PT | ALPHA | ZETA* | THICKNESS | UPSILON |
|----|----------|---------|-----------|----------|
| 1 | 1.45592 | 33.474 | 0.05425 | 0.61515 |
| 2 | 1.38439 | 32.690 | 0.07465 | 0.56921 |
| 3 | 1.24263 | 31.311 | 0.11306 | 0.48203 |
| 4 | 1.10273 | 30.107 | 0.14808 | 0.39988 |
| 5 | 0.96463 | 28.859 | 0.17953 | 0.32208 |
| 6 | 0.81455 | 26.924 | 0.21045 | 0.24238 |
| 7 | 0.65305 | 23.770 | 0.24014 | 0.16557 |
| 8 | 0.49401 | 20.058 | 0.26676 | 0.10159 |
| 9 | -0.33815 | 16.695 | 0.29162 | 0.05024 |
| 10 | 0.18558 | 14.479 | 0.31615 | 0.00826 |
| 11 | 0.03746 | 12.805 | 0.34211 | -0.02749 |
| 12 | 0.10545 | 10.461 | 0.37510 | -0.05664 |
| 13 | 0.24165 | 5.873 | 0.40967 | -0.07486 |
| 14 | 0.37064 | -4.427 | 0.43497 | 0.07218 |
| 15 | 0.49128 | 23.508 | 0.44546 | -0.02941 |
| 16 | 0.60052 | -44.490 | 0.42855 | 0.07601 |
| 17 | 0.69870 | -59.732 | 0.37651 | 0.26027 |
| 18 | 0.78502 | -69.451 | 0.30928 | 0.53949 |
| 19 | 0.84695 | -74.644 | 0.26399 | 0.85840 |

MEANLINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AL | T/C | ALPHA | UPSILON | ZETA* |
|----|--------|---------|----------|---------|--------|
| 1 | 0. | 0.02343 | -1.45592 | 0.61515 | 32.866 |
| 2 | 0.0250 | 0.03053 | -1.39835 | 0.57810 | 32.560 |
| 3 | 0.0500 | 0.03748 | -1.34078 | 0.54184 | 31.852 |
| 4 | 0.0750 | 0.04421 | -1.28321 | 0.50650 | 31.259 |
| 5 | 0.1000 | 0.05073 | -1.22564 | 0.47188 | 30.804 |
| 6 | 0.1250 | 0.05704 | -1.16806 | 0.43783 | 30.389 |
| 7 | 0.1500 | 0.06314 | -1.11049 | 0.40435 | 29.979 |
| 8 | 0.1750 | 0.06901 | 1.05292 | 0.37142 | 29.556 |
| 9 | 0.2000 | 0.07466 | -0.99535 | 0.33907 | 29.089 |
| 10 | 0.2300 | 0.08112 | -0.92626 | 0.30112 | 28.442 |
| 11 | 0.2600 | 0.08725 | -0.85718 | 0.26434 | 27.578 |
| 12 | 0.2900 | 0.09308 | 0.78809 | 0.22907 | 26.476 |
| 13 | 0.3200 | 0.09863 | 0.71900 | 0.19561 | 25.179 |
| 14 | 0.3500 | 0.10394 | 0.64992 | 0.16419 | 23.692 |
| 15 | 0.3800 | 0.10903 | -0.58083 | 0.13501 | 22.087 |
| 16 | 0.4100 | 0.11396 | 0.51174 | 0.10813 | 20.434 |
| 17 | 0.4400 | 0.11876 | -0.44266 | 0.08352 | 18.788 |

PHASE III ROTOR

COORD SYSTEM ORIGIN 7 -7.04880 R O. NI O. EIA O.

SECTION NO 13 SECTION NW RND 2.5000

MEAN LINE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | PCT AT | T/C | ALPHA | UPSILON | ZETA |
|----|--------|---------|---------|----------|---------|
| 18 | 0 4700 | 0 12350 | 0 37357 | 0 06103 | 17.302 |
| 19 | 0 5000 | 0 12825 | 0 30448 | 0 04039 | 16 003 |
| 20 | 0 5300 | 0 13305 | 0 23540 | 0 02129 | 14.959 |
| 21 | 0 5600 | 0 13788 | 0 16631 | 0 00335 | 14 177 |
| 22 | 0 5900 | 0 14290 | 0 09723 | 0 01362 | 13.417 |
| 23 | 0 6200 | 0 14855 | 0 02814 | -0 02958 | 12.584 |
| 24 | 0 6500 | 0 15514 | 0 04095 | -0 04434 | 11 470 |
| 25 | 0 6800 | 0 16249 | 0 11003 | -0 05745 | 9.940 |
| 26 | 0 7100 | 0 17021 | 0 17912 | 0 06821 | 7.572 |
| 27 | 0 7400 | 0 17757 | 0 24821 | -0 07535 | 4.013 |
| 28 | 0 7700 | 0 18386 | 0 31729 | -0 07694 | -1.905 |
| 29 | 0 8000 | 0 18885 | 0 38638 | -0 06948 | -10.905 |
| 30 | 0 8300 | 0 19196 | 0 45547 | -0 04818 | -23.820 |
| 31 | 0 8600 | 0 19173 | 0 52455 | 0 00600 | 38.753 |
| 32 | 0 8900 | 0 18603 | 0 59364 | 0 06665 | 53.051 |
| 33 | 0 9200 | 0 17262 | 0 66272 | 0 18117 | -63.482 |
| 34 | 0 9500 | 0 15181 | 0 73181 | 0 33760 | -71.139 |
| 35 | 0 9750 | 0 13211 | 0 78938 | 0 55911 | 77.649 |
| 36 | 1 0000 | 0 11400 | 0 84695 | 0 85840 | -79.722 |

CHORD 2 3157 STAGGER -6.030 CAMBER 112.588

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PT | T/C | ALPHA | UPPER UPSILON | LOWER ALPHA | UPSILON |
|----|---------|----------|---------------|-------------|---------|
| 1 | 0 02343 | -1.45592 | 0 61515 | -1.45592 | 0 61515 |
| 2 | 0 02343 | -1.46010 | 0 59187 | -1.43685 | 0 62840 |
| 3 | 0 02343 | -1.44977 | 0 57498 | -1 41686 | 0 62604 |
| 4 | 0 03053 | -1.41738 | 0 54831 | -1 37933 | 0 60790 |
| 5 | 0 03748 | -1.36368 | 0 50498 | -1 31788 | 0 57870 |
| 6 | 0 04421 | 1 30977 | 0 46275 | -1 25665 | 0 55025 |
| 7 | 0 05073 | -1.25571 | 0 42143 | -1 19556 | 0 52232 |
| 8 | 0 05704 | -1.20147 | 0 38086 | -1 13465 | 0 47481 |
| 9 | 0 06314 | 1 14702 | 0 34102 | -1 07396 | 0 46767 |
| 10 | 0 06901 | -1 09234 | 0 30191 | -1 01350 | 0 44092 |
| 11 | 0 07466 | 1 03737 | 0 26354 | -0 95332 | 0 41461 |
| 12 | 0 08112 | -0 97093 | 0 21854 | -0 88153 | 0 38371 |
| 13 | 0 08725 | -0 90394 | 0 17480 | -0 81041 | 0 35388 |
| 14 | 0 09308 | -0 83614 | 0 13260 | -0 74004 | 0 32554 |

PHASE III ROTOR

COORD SYSTEM ORIGIN 2 -7.04880 R 0.0 MJ 0.0 ETA 0.0

SECTION NO 13 SECTION NW RRU 2.5000

SURFACE COORDINATES WITH ORIGIN AT SECTION AXIS

| PI | I/C | UPPER | | LOWER | |
|----------------|---------|-----------------|----------|----------|---------|
| | | ALPHA | UPSILON | ALPHA | UPSILON |
| 15 | 0.00863 | -0.76759 | 0.09226 | 0.67042 | 0.29896 |
| 16 | 0.10394 | 0.69827 | 0.05399 | 0.60156 | 0.27439 |
| 17 | 0.10903 | 0.62830 | 0.01804 | -0.53336 | 0.25199 |
| 18 | 0.11306 | -0.55781 | -0.01552 | -0.46568 | 0.23177 |
| 19 | 0.11876 | -0.48694 | 0.04665 | -0.39837 | 0.21370 |
| 20 | 0.12350 | -0.41610 | -0.07549 | -0.33104 | 0.19756 |
| 21 | 0.12825 | 0.34542 | -0.10235 | -0.26355 | 0.18314 |
| 22 | 0.13305 | -0.27516 | -0.12754 | -0.19563 | 0.17011 |
| 23 | 0.13788 | -0.20541 | -0.15142 | 0.12721 | 0.15813 |
| 24 | 0.14290 | -0.13562 | -0.17456 | -0.05884 | 0.14732 |
| 25 | 0.14855 | -0.06561 | -0.19745 | 0.00933 | 0.13829 |
| 26 | 0.15514 | 0.00523 | -0.22038 | 0.07667 | 0.13170 |
| 27 | 0.16249 | 0.07756 | -0.24276 | 0.14251 | 0.12786 |
| 28 | 0.17021 | 0.15315 | -0.26357 | 0.20509 | 0.12715 |
| 29 | 0.17757 | 0.23382 | -0.28044 | 0.26259 | 0.12975 |
| 30 | 0.18386 | 0.32437 | -0.28970 | 0.31022 | 0.13583 |
| 31 | 0.18885 | 0.42774 | -0.28419 | 0.34501 | 0.14522 |
| 32 | 0.19196 | 0.54523 | -0.25151 | 0.36570 | 0.15515 |
| 33 | 0.19173 | 0.66351 | 0.17912 | 0.38559 | 0.16713 |
| 34 | 0.18603 | 0.76578 | -0.06283 | 0.42150 | 0.19613 |
| 35 | 0.17562 | 0.84157 | 0.09193 | 0.48388 | 0.27041 |
| 36 | 0.15181 | 0.89815 | 0.29077 | 0.56548 | 0.40442 |
| 37 | 0.12111 | 0.93881 | 0.52639 | 0.63996 | 0.59183 |
| 38 | 0.11400 | 0.96084 | 0.70379 | 0.68654 | 0.75972 |
| 39 | 0.11400 | 0.94262 | 0.79117 | 0.74555 | 0.83855 |
| 40 | 0.11400 | 0.84695 | 0.85840 | 0.84695 | 0.85840 |
| LF RAD 0.03059 | | CENTER AT ALPHA | -1.43024 | UPSILON | 0.59853 |
| TF RAD 0.14045 | | CENTER AT ALPHA | 0.82135 | UPSILON | 0.72030 |

780.

PHASE III ROTOR

COORD SYSTEM ORIGIN Z -7.04880 R O. MJ O. MS 20 ETA O.

SECTION NO 13 SECTION NW RHO 2.5000

CHORD 2.3157 STAGGER -6.030 CAMBER 112.588

AREA 0.881509 SURFACE ARC LENGTH 6.38549

| | | |
|------------------------|----------|---------|
| SECTION C G. | ALPHA | UPSILON |
| SURFACE SECTION C G | 0.10295 | 0.16952 |
| BLADE AXIS | 0.09331 | 0.00598 |
| STACKING AXIS (RADIAL) | 0.09331 | 0.44508 |
| | -0.00210 | 0. |

PLATE III ROTOR

•/PC•

| STC | NR | RHO | STAGE | 3. | ROTOR | NR | 20 | 7FIA1 | ZEIA2 |
|-----|----|---------|--------|-------|--------|---------|-------|--------|-------|
| AA | 1 | 8 50000 | 4.0639 | 61.49 | -3.48 | 0.02378 | 57.43 | 60.91 | |
| BB | 2 | 8 00000 | 4.0029 | 56.60 | 1.74 | 0.02559 | 55.37 | 53.63 | |
| CC | 3 | 7 50000 | 3.9854 | 52.29 | 6.24 | 0.03037 | 53.72 | 47.48 | |
| DD | 4 | 7 00000 | 3.9558 | 48.24 | 11.44 | 0.03896 | 52.30 | 40.86 | |
| EE | 5 | 6 50000 | 3.8854 | 43.95 | 18.51 | 0.05082 | 51.27 | 32.77 | |
| FF | 6 | 6 00000 | 3.7695 | 38.82 | 28.85 | 0.06231 | 50.41 | 21.56 | |
| GG | 7 | 5 50000 | 3.6694 | 33.21 | 45.13 | 0.07205 | 49.29 | 4.17 | |
| HH | 8 | 5 00000 | 3.4555 | 27.03 | 65.20 | 0.08347 | 47.51 | -17.69 | |
| IJ | 9 | 4 50000 | 3.1627 | 21.91 | 87.38 | 0.09603 | 45.51 | 41.87 | |
| KK | 10 | 4 00000 | 2.8738 | 16.04 | 100.35 | 0.11178 | 43.94 | 56.41 | |
| LL | 11 | 3 50000 | 2.6364 | 9.24 | 109.38 | 0.12865 | 41.82 | 67.55 | |
| MM | 12 | 3 00000 | 2.4534 | 1.85 | 113.11 | 0.15819 | 38.32 | -74.79 | |
| NN | 13 | 2 50000 | 2.3157 | -6.03 | 112.59 | 0.19196 | 32.87 | -74.72 | |

THE COORDINATES FOR THIS BLADE WERE PUT ON TAPE
IN THE SAME ORDER AS PRINTED ABOVE

SECTION XV

REFERENCES

1. A.J. Wennerstrom, and W.A. Buzzell, Redesign of a Rotor for a 1500 ft/sec Transonic, High-Through-Flow, Single-Stage Axial-Flow Compressor with Low Hub/Tip Ratio, Air Force Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio 45433, AFAPL-TR-2078, September 1979.
2. George R. Frost, Richard M. Hearsey, Arthur J. Wennerstrom, A Computer Program for the Specification of Axial Compressor Airfoils, Aerospace Research Laboratories, Wright-Patterson Air Force Base, Ohio 45433, ARL 72-0171,
3. Richard M. Hearsey, A Revised Computer Program for Axial Compressor Design Volume I, Aerospace Research Laboratories, Wright-Patterson Air Force Base, Ohio 45433, ARL TF 75-0001, January 1975.
4. Arthur J. Wennerstrom, Personal Communication to L.H. Smith of General Electric Company, September 12, 1980.